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EDITORIAL

When we embarked upon the issue of this journal in the spring of 1957, it was our plan to publish in it, at regular intervals, articles describing the study of various branches of science being carried out in the Netherlands. We cherished the hope – call it, if you like, the illusion – of being able in this way to serve a wider purpose than merely to provide people in other countries with information – the hope, that is, that an inventory of this nature would also prove a stimulus to improve the co-operation between, and the co-ordination of, scientific work in our country. We hoped, in addition, to be able gradually to compile out of a series of these *capita selecta* an account of the state of knowledge in the Netherlands.

It is accordingly with particular satisfaction that we invite your attention to the articles by Professor Tinberg and Professor Theil on university teaching and research in the field of quantitative economics which we are publishing in the present issue.

We did not select this branch of science for treatment because it can boast a long and venerable tradition – indeed, in this particular case any historical survey would have of necessity to be exceptionally brief. No, there are other reasons for dealing with the subject in our quarterly, to wit, the intensity with which this new field of knowledge has been "brought into cultivation" in the Netherlands and the interest which has been displayed in this work in other countries.

It is in connection with this interest shown abroad that we would draw particular attention to the final paragraph of Professor Tinbergen's article, in which he announces a plan for the Netherlands Economics Institute and the Econometric Institute to provide research facilities to post-graduate students from other countries. We need hardly say that NUFFIC welcomes this plan with interest and will be glad to lend its assistance to see it realized. One of our Foundation's main aims is to promote higher education and research of a nature capable of meeting needs felt beyond our own country's frontiers. That in this case it should not be an international course that is involved but research facilities for an international group of scientific workers cannot but be a cause for greeting the project with even greater interest. Finally, we are able to announce that the possibility of awarding a fellowship for this research work in a strictly limited number of cases and on the grounds of special aptitude is at present under consideration. Further details can be obtained from NUFFIC at 27, Molenstraat, The Hague.

QUANTITATIVE ECONOMICS IN THE NETHERLANDS

MODEL BUILDING FOR ECONOMIC POLICY

Introductory

A considerable part of recent research as well as of teaching in the field of quantitative economics in the Netherlands has been grouped around the objective of supplying tools for economic policy. This applies to short-term as well as to long-term economic policy and to policies for developed as well as for under-developed economies. The elements needed for such research cover most of the subjects traditionally included in teaching programmes of this kind, but give them a certain twist and direction. It is the intention of this article to give a brief survey of teaching and research activities as they now exist in this country, more particularly at the Netherlands School of Economics, while indicating the links with practical activities in the field of economic policy.

Teaching programmes at the Netherlands School of Economics are more comprehensive than those in other Dutch schools or universities, but the main subjects are taught at the latter as well, i.e. at the Municipal University of Amsterdam, the Roman Catholic School of Economics at Tilburg, at the State University at Groningen and at the Free (Reformed) University of Amsterdam.

In the 'twenties' the Rotterdam School included only three courses bearing on quantitative research methods in its programme, one statistics course, one mathematics course and one course called statistical analysis. The statistics course was obligatory for all students, and dealt with administrative statistics and some elementary methodology. Statistical analysis was a subject taken by a few students only and this group was obliged to take mathematics also. Roughly speaking, the subject covered Yule's textbook and was taught by an insurance mathematician. The three courses were taken over by the present author in 1933 and adapted rather more fully to the needs of economic research at that time. It was soon recognized that some specialization among the teachers was necessary and in the late 'thirties' an additional professor was charged with a course in mathematical statistics. Elementary statistics was transferred to a lecturer and the subject of statistical analysis divided into two subjects, mathematical economics and econometrics. Although, in principle, the latter subject could have covered the former too, the practical set-up was to give one course in pure mathematical economics and another in the various phases involved in any piece of concrete econometric research covering mathematical economics and statistical inference, both applied to concrete research problems.

Immediately after the war, the mathematical approach to economics was made an obligatory subject for all students, which means that they now have to follow a mathematics course and that the general course in economic theory is based on some mathematical knowledge.

A few years ago a major improvement in the training facilities in quantitative economic research was introduced, consisting of the creation of a department of quantitative economics and the appointment of Professor Henri Theil, who also heads the newly-created Econometric Institute.

Finally, the subject of development planning (or programming) has quite recently been added to the other subjects taught at the Netherlands School of Economics. It is the successor to what was previously called "oriental economics" and the change of name also indicates a change in approach, supposed to be in line with world developments.

The total number of teachers in the field of quantitative research is now 11, distributed over the various subjects in the following way:

3 professors for (1) mathematical economics and development programming;
(2) econometrics;
(3) market analysis and business statistics;

2 lecturers for (1) mathematics and statistical analysis;
(2) statistics;

1 teacher for mathematics; and

5 "assistants" for these subjects.

A detailed survey of the subjects taught is given in Professor Theil's article in this bulletin.

Teaching

Of the courses having some relationship to quantitative research on behalf of economic policy mention may be made of the following.

1. *Mathematical economics.* Courses in general economic theory followed by all students are based on some knowledge of mathematics, taught in the first year and covering some infinitesimal calculus, some analytical geometry and some simple algebra of linear equations. A special course in mathematical economics is available for those who choose quantitative research as their special subject. It is a two-year course of two hours weekly and its main purpose is to discuss the various types of equations composing a complete economic model. In the first year, the various types of equations are discussed and illustrated, special attention being paid to behaviour equations. The subject matter is subdivided into static and dynamic theories, into "psychological" and "calculatory" behaviour equations and distinguishes between demand for and supply of the factors of production in addition to products. The importance of using measurable phenomena, if only as dummy variables, is emphasized with a view to application to concrete situations. In the second year, complete models and their implications are treated, geared as far as possible to policy applications, such as anti-cyclical policies, social policy and development policy.

2. *Econometrics.* As has already been stated, the successive courses given under this heading have concentrated on the practical side of econometric work, emphasizing the links between the elements of mathematical economics and statistical inference to be applied to the same concrete research subject. With the development of econometric methods, the subject has expanded considerably and nowadays requires a thorough knowledge of mathematical statistics. Accordingly, the number of auxiliarly courses has also been increased.

3. *Statistical Inference.* Courses on this subject began, in the 'twenties', with curve-fitting and correlation. At present, such subjects as the testing of hypotheses, estimation of a set of simultaneous equations and problems of aggregation are

taught in fairly extensive detail. Students are provided with a solid background in the probability theory of multidimensional distributions.

Applications are to a large extent chosen in the field of model building for policy purposes, as practised in the Central Planning Bureau of the Dutch Government.

4. *Development programming.* In this course some of the recent models of a growing economy are discussed and analyzed, with a view to their application in development programming. To start with, the simplest versions of Domar-Harrod models are treated and the following complications are introduced one by one: a finite gestation period, the existence of several sectors (including foreign countries), the existence of inter-sector deliveries (as represented by input-output analysis) and the existence of several technologies to produce the same product. In this course, the emphasis has to be laid on practical matters, requiring, among other things, an understanding of the sociological background to a development policy, the application of simplified methods, such as the appraisal of individual investment projects according to some practical method, and the translation of findings into a concrete policy.

Apart from the courses mentioned by Professor Theil and in this article there are several others in the Netherlands School of Economics dealing with quantitative aspects of economic policy; in particular, the courses in monetary phenomena and policies and in public finance.

Research

In the Netherlands there is a very close connection between teaching and research. This also applies to research undertaken elsewhere than in university institutes, resulting to a large extent from personal ties between university teaching staff and research workers in the non-university institutes. Several part-time professors hold important functions in government institutions and thereby form immediate links. Quite a few of the full-time professors were formerly members of the research staff of non-university institutes and are often still consultants. The small size of the Dutch community therefore results in a slighter degree of separation of, or division of labour between, pure theory and practical research than seems to be customary in some of the larger countries.

Some of the main centres for quantitative economic research with a bearing on policy problems are, in decreasing order of ties with teaching, the Econometric Institute at the Netherlands School of Economics; the Netherlands Economics Institute [1] and comparable institutes at the Municipal University of Amsterdam and the Catholic School of Economics at Tilburg; the Central Planning Bureau of the Netherlands Government, the Central Bureau of Statistics and various research departments at the Ministries (e.g. of the Treasury and of the Ministry of Economic Affairs) and the Central Bank (De Nederlandse Bank N.V.). Finally, a number of technical departments in government ministries should be mentioned. The largest according to the numbers actually engaged in research are probably The Central Planning Bureau, headed by Professor P. de Wolff of the Municipal University of Amsterdam (whose deputy is Professor P. J. Verdoorn of the Netherlands School of Economics) and the Netherlands Economics Institute.. According to total man-power, however, the Central Bureau of Statistics, headed by Professor Ph. J. Idenburg, is by far the largest.

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[1] See the "Institutions" section in the Chronicle of this Bulletin.

The type of research undertaken at the Central Planning Bureau is determined by its task, i.e. to advise the government and the Social Economic Council on all matters concerned with the co-ordination of general economic policy. This means that whenever the general interdependence of the various sectors of the economy is at stake, advice will be sought from this Bureau. It has therefore specialized on illustrating, in numerical form, this interdependence, using both short-term and long-term economic models based on the Dutch economy. In so far as export markets are analyzed, some work on foreign economies has also been undertaken. The models used by the Bureau have been frequently published and also comparisons between the forecasts made and the results actually achieved (cf. Professor Theil's article in this issue). The models do not only aim at making forecasts, but also at calculating alternative developments to be expected from policy changes. During the last few years a considerable amount of research has been invested into a new short-term model, in co-operation with the Central Bureau of Statistics, the Netherlands Economics Institute and the Mathematical Centre at Amsterdam. The model itself constitutes, as did its predecessors, a macro-model with some 30 variables, but its results are tested with the aid of a multi-sector model, distinguishing eleven sectors. Its predecessors have been used for the annual "Central Economic Plans" and for a considerable number of recommendations by the Social Economic Council, covering such subjects as social insurance reforms, wage policy, rent policy, employment policy and industrialization policy. The long-term models have been used mainly to provide a background to the last-mentioned policy. In co-operation with the Central Bank's Research Rivision a considerable amount of work has also been devoted to the elaboration of financial accounts for the national economy.

Most of the staff of the Netherlands Economics Institute are engaged in research for municipalities and private firms; the former type, of course, often implies policy questions also, mainly town or regional development policy. A small group works on problems concerning the development of underdeveloped countries. Models for general programming as well as for the appraisal of individual projects have been constructed. In addition, detailed studies of the availability of alternative methods of production in well-defined industries are made in co-operation with a research institute of the Technological University at Delft.

Opportunities offered to foreign students

Teaching at the Dutch universities has so far been done, with very few exceptions, in the Dutch language. This limits the opportunities for foreign students to follow their courses. It was formerly the tradition that a number of Indonesian students formed part of the student body, but this has been brought to an end by the Indonesian Government. Participation in research by foreign scholars and students has been more frequent, since each member of the staff of the research institutes speaks English and contacts are easily made there. In fact, a considerable number of foreigners have worked at the Central Planning Bureau and the Netherlands Economics Institute.

Shortly after World War II, the Institute of Social Studies was founded in a common effort by all Dutch universities to open up new opportunities to foreign students.

This institute offers courses and facilities for research in English and the overwhelming majority of its students come from abroad. Its subjects do not cover much of the subject matter discussed in this article, with the exception of part of the work done in the Six-month Course in Economic Planning. This course, which is open to those who have practical experience and responsibility in the subject, includes quantitative economic analysis together with a number of practical subjects, but does not specialize in the direction of mathematical statistics. It is intended for those responsible for planning work rather than for experts specialized in some of the mathematical techniques.

At present, plans are being considered to offer research facilities in quantitative economics to foreign post-graduate students, sponsored jointly by the Division of Balanced International Growth of the Netherlands Economics Institute and by the Econometric Institute of the Netherlands School of Economics. Research could be undertaken in one of the following subjects:

(1) Development programming by means of economic models;
(2) Appraisal of investment projects;
(3) Statistical inference in economics;
(4) Economic forecasts and rational decision-making.

Whether these plans materialize will depend on the interest shown by prospective participants.

J. TINBERGEN [1]

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[1] Dr. Tinbergen is Professor of Mathematical Economics and Development Planning at the Netherlands School of Economics, Rotterdam.

ECONOMIC FORECASTS AND THE PROBLEMS INVOLVED IN DECISION-MAKING UNDER CONDITIONS OF UNCERTAINTY

Introduction

For many decades now both economists and laymen concerned with economic affairs have been interested in economic forecasts. Their interest is sometimes rather cynical, sometimes constructive; but whatever the case, a whole series of questions looms up. Is it at all possible to make forecasts of reasonable reliability? Is it really necessary to make forecasts at all – cannot one just as well base one's decisions on what is happening at the moment? Is it true that forecasts of changes within a short-term period (e..g. a month or a quarter) are usually more reliable than long-term forecasts? Must one apply very modest standards in judging the quality of forecasts and even, perhaps, be content if they differ less markedly from what really happens than do simpler methods of extrapolation? And how is one to measure their quality? When what is forecast can be represented by a single figure, this seems easy enough (one simply takes the difference between forecast and reality); but how is one to set to work when the merits of a whole series of forecasts requires assessment? Is this merely a question of calculating individual forecasting errors and then taking an average, or is it advisable to take account explicitly of the importance of the various things hat are foreccast? And as regards this last point, would it perhaps be advisable to take into account the policy based on the fortcasts? As one will have seen, here the problems referred to in the second part of the title of this article come into play.

I hope that the reader does not expect me to supply an exhaustive answer in a nutshell to all these and similar questions. One of the difficulties in the way of doing so is that forecasting on anything resembling a systematic basis is only of recent origin in economics. It is not possible, therefore, to draw on a rich fund of experience as it is in other fields, for example, in meteorology. Naturally, there have been forerunners, like the famous (perhaps I should say notorious) Harvard barometer, which enjoyed a certain prestige, particularly in the nineteen-twenties. This barometer consisted of three component time-series, one related to the Stock Exchange, one to trade in commodities, and one to the money market. It was hoped that the first would always be in advance of the other two (as it had been, more or less, for some time), so that it would be possible to make forecasts of changes in production and employment. The barometer did not, however, prove a very successful device, particularly not during the depression in the 'thirties'. Looking back, we need hardly feel any surprise at this, for the barometer was a pretty primitive affair. It should be said in its defence, however, that thirty years ago the possibilities of arriving at successful forecasts were not abundant. In the first place, few economic statistics were recorded and those that were available were often of poor quality. In the second place, mathematical statistics were still in their swaddling clothes, while, finally, economic science has also come further along the road since those days.

It is only natural, therefore, that the greater part of the results obtained in the field of economic forecasts should refer to the period subsequent to the Second World War. It is the intention of this article to give a brief account of these, in doing which I shall be confining myself mainly to the work done by the Econometric Institute of the Netherlands School of Economics. The final section contains a short survey of the specialized study of quantitative economics at this school.

The central economic plans, 1949-1956

The serious economic problems of the 'thirties' and the dislocation of the war years have induced the governments of several western countries in the post-war period to extend the statistical data on economics at their disposal in two ways; in the first place, the records that were already being compiled relating to past periods became more detailed, while, in the second place, a beginning was made with the compilation of forecasts of the national income, total consumption and investment, the price level, the level of employment and the balance of payments, etc. In most cases these forecasts relate to anticipated changes in these variables during the coming calendar year, and it is to these that I shall be confining my remarks in what follows; forecasts have been made for longer periods as well, while at the moment of writing [1] the unemployment trend is of such a nature that a close watch is being kept on the changes from month to month by government circles and in the daily press. Macro-economic forecasts are published every year by the Netherlands Central Planning Bureau under the title of "The Central Economic Plan". The term "plan" in this connection should not, however, be taken at its face value, since it results from a mistaken forecast of the political situation shortly after the war and suggests – as it should not – a relationship to the economic plans drawn up in the countries of Eastern Europe. In actual fact, the Central Economic Plan is nothing other than a well-arranged collection of forecasts for the coming year, comparable in all respects to the forecasts that have been drawn up for years now by large business firms for the benefit of the directors, and comparable also to what the meteorologists do every day for the benefit of the general public. The only remarkable thing about the matter in my view is that it took such a long time before anything was done to arrive at the compilation of "economic weather reports" of this kind.

The compilation was very primitive in the first, difficult years after the war, the work being done by "trial and error" methods. A change soon came about in this state of affairs, however; that is to say, the technique of forecasting was rendered more systematic by making use of a system of econometric equations which describes the diverse relationships in a simplified algebraic form, whereby relevant economic variables are related the one to the other. For instance, the Central Economic Plan for 1955 was based on a system of 27 equations describing 27 endogenous variables in their dependence upon a large number of exogenous variables.[2] Among the items included in the first category are the total consumption, investment and the level of employment; the last-mentioned category consists of two groups, viz., "government variables", such as government expenditure on wages and salaries, on goods and services, rates of taxaion and the like, and other exogenous (particularly foreign) variables, such as the level of import prices. If one then makes forecasts of the probable trend of the last-mentioned group and, in addition, assumptions as to the government's behaviour with regard to its own variables in the coming period, it is possible, on the basis of the system of equations, to calculate the corresponding forecasts of the endogenous variables. By making alternative suppositions as to the behaviour of the government, it is possible to estimate the consequences of various measures with respect to the trend of employment, the balance of payments and the like, so that in this way this forecasting technique is turned into a serviceable instrument for use in coming to rational decisions in the field of macro-economic policy.

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[1] May 1958.
[2] Central Economic Plan, 1955, Appendix. The Hague, 1955

The degree to which it actually proves useful for the above-mentioned purpose is largely determined, of course, by its accuracy. Some idea of this is provided by Fig. 1, in which forecast and actual changes with respect to a number of variables in the period 1949–1956 are shown side by side.[1] The information provided here relates to changes from year to year, all measured as percentage deviations from the value of the relevant variable in the preceding year.[2] If one had hit the bull's eye every time, all the points would have lain on the upward sloping line running through the origin (the "perfect forecasts line"). Of course, this is not the case, though it should be said that the errors in the forecasts are not of such a nature as to cause any alarm in the circles of professional economic forecasters. This is, perhaps, modesty forced upon us by sheer necessity. One notices, moreover, that a large majority of the points to the right of the vertical axis lies below the perfect forecasts line. This points to a bias in the direction of the underestimation of mutations, a feature often met with in forecasts in the economic field (and probably in other fields as well).[3] I must add to this that the forecasts discussed above are all "final" forecasts which in some cases were published several months after the beginning of the forecast year. Naturally, this delay has an effect on the quality of the forecasts, since when some months of the year concerned have passed, one can make use of information which has become available in the meantime. It is, indeed, true that on the average the forecasts based on the provisional versions of the Central Economic Plans display wider divergences than the final versions; in the majority of cases, that is to say, the revisions brought the forecasts into closer proximity to the actual changes which were the goal of prediction. One must certainly not, on the other hand, overestimate the success of these revisions. This is illustrated in Fig. 2, which shows the frequency distribution of over 200 "revision ratios". For example, let us assume that total consumption in a given year is first expected to rise by 3 %, that this figure is later revised and put at 4 % and that the actual increase proves to be 8 %. The revision amounted to 1% (from 3 % to 4 %), whereas it ought to have been 5 % in order to have arrived at a perfect forecast, and in this case the revision ratio is $^1/_5$. As long as this ratio is positive and less than 1, the revision was in the right

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[1] The year 1952 has been omitted, since alternative forecasts only were made for that year. Thus the dots drawn in Fig. 1 relate to six years and to about twenty variables. The data in Figs. 1 and 2 have been taken from the work of Mr. C. van de Panne.

[2] The actual changes are measured as deviations from actual values in the previous year, according to the latest data. The forecast changes, on the other hand, are measured as deviations from the "provisional" actual values in the previous year, according to the information available when the forecasts were made. This distinction is made so as to prevent imperfect knowledge of the recent past from obscuring the picture presented by the forecasts. Naturally, a completely exact picture is out of the question, since any statistical representation of reality is liable to errors of measurement.

[3] The forecasts mentioned in this paragraph refer to both exogenous and endogenous variables. The "conditional" forecasts of endogenous changes can also be studied; these are calculated by substituting the actual changes in the exogenous variables in the system of equations used. The forecasts dealt with in the text show the ultimate result of the forecasting technique, actually quite apart from the method followed; the conditional method is more appropriate for assessing the quality of the equation system. The latter forecasts are of higher quality; generally speaking, underestimation of changes does not occur in them.

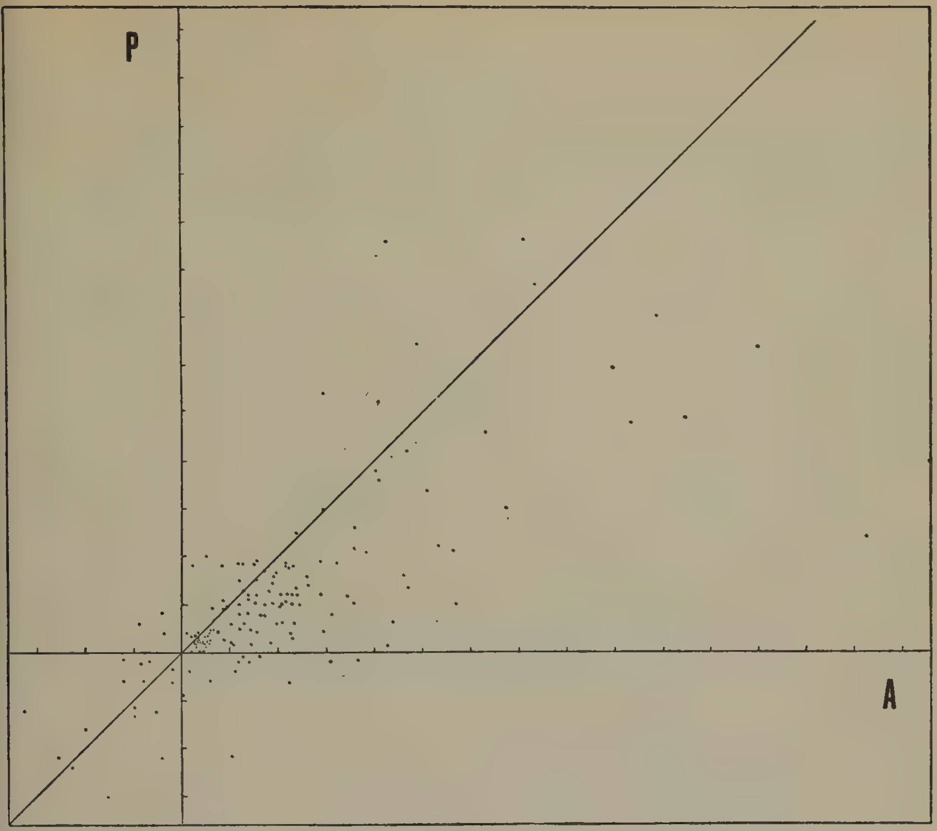
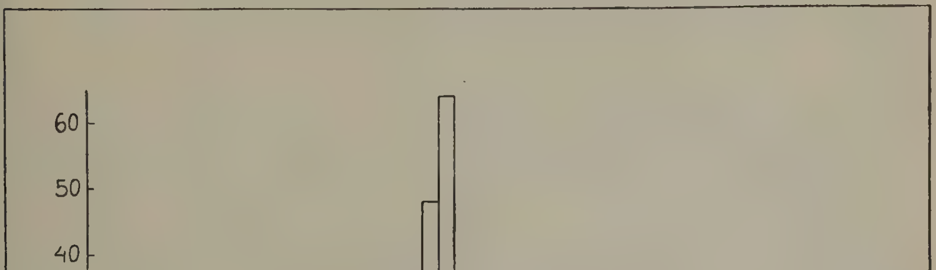


Fig. 1. Predicted (P) and Actual (A) changes according to the Central Economic Plans, 1949–1956.

Fig. 2. Frequency distribution of revision ratios.



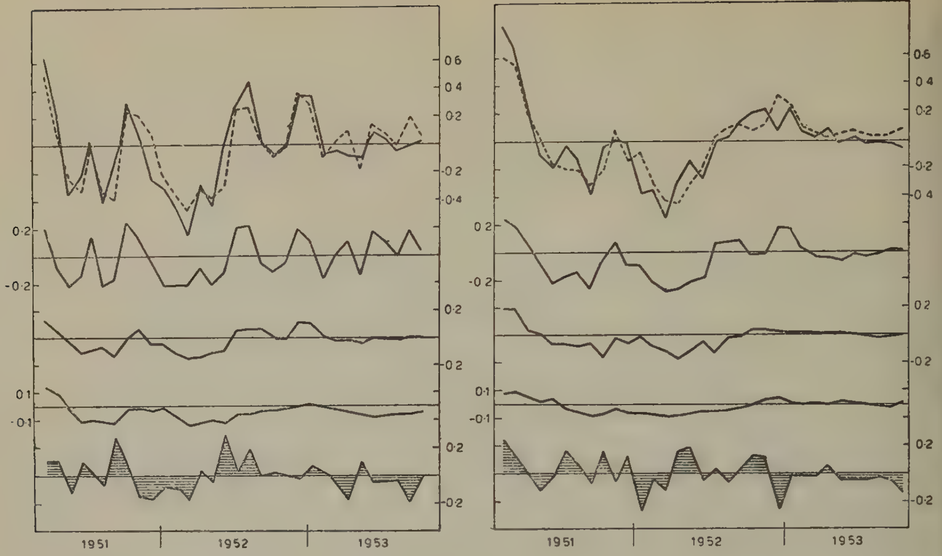
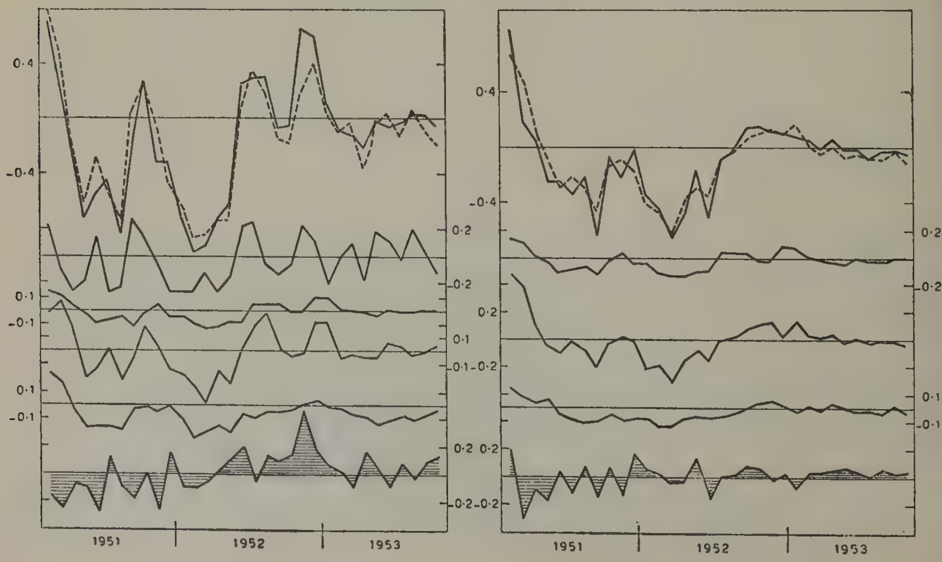


Fig. 3. The selling price plans of leather tanners and shoe manufacturers in Western Germany and the factors determining these plans, 1951–1953.

Fig. 4. The actual selling prices of leather tanners and shoe manufacturers in Western Germany and the factors determining these prices, 1951–1953.



direction; if it lies above 1, the revision was greater than it should have been, though the new forecast will be nearer to reality as long as the ratio is less than 2. If the ratio is negative, the adjustment was in the wrong direction. Fig. 2 shows that most revised forecasts are, in fact, in the right direction but that the large majority of them did not go far enough, while in a fairly considerable minority of the cases the revision was still in the wrong direction.[1]

Analysis of survey data

Surveys have become very popular since the Second World War. The best known are those involving the consumer, who nowadays gets asked when he was last in a cinema, if he is planning to buy a car next year, if he expects to be earning more neent year, if he thinks prices will be going up, going down or staying the same in the next six months, etc., etc. But surveys are also being held fairly extensively in the field of business nowadays, enquiries with regard to investment, in particular, having acquired a certain reputation.

In this section I shall have something to say about a certain form of survey to do with the plans and expectations of entrepreneurs. It may at first sight seem strange that plans and expectations (which are often rather vague!) should be placed under the heading of "forecasts". But if we interpret the word forecasts to mean statements, in any form, relating to events in the future, we may certainly include plans and expectations within the meaning of the term. Expectations are, then, statements regarding future events not controlled by the forecaster himself (such as anticipated sales, anticipated purchasing prices); and plans are statements regarding the forecaster's own future actions (investment plans, sales prices plans, etc.) The following problem, however, is of a more substantial nature: if one seeks information from the firms' leading men, one practically always finds that they have little time to spare; the questions asked must accordingly be neither too numerous nor – and this is more important – too detailed. For this reason the *IFO-Institut für Wirtschaftsforschung* at Munich has limited itself in its enquiries to obtaining information on trends – i.e. the entrepreneur is asked whether he expects the purchasing price of a certain raw material to rise, fall or remain the same in the coming month, but he is not asked to quote the percentage by which he expects the price to rise or fall. Such questions relate also to actual, in contrast to forecast, developments (Has the price risen, fallen or remained the same since last month?) and to a large number of economic variables (prices, sales, production, stocks, etc.) and to a fairly large number of sectors of industrial and commercial activity. This method, devised in Germany in 1949, has undergone rapid development since and is being applied at the moment in many other countries, including the Netherlands, Sweden, Austria, South Africa and Japan.

This set-up involves many problems – among them those to do with survey technique – and I certainly cannot say that all of them have been solved. I shall confine myself here to a single aspect of what can be done with this material, with special reference to the fairly extensive body of economic theories which have something to say, in one way or another, about the plans and expectations of "economic subjects". A weak point about these theories was always the fact that there was no real means of testing them out; the traditional statistical material – as published by official bureaux of statistics – relates, that is, exclusively to actual, not forecast, developments, The survey data referred to above do, therefore, offer some opportunity of improving on this.

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[1] The distribution in Fig. 2 is limited to the interval —2 to +3. In fact, one should imagine a total frequency of 6% to the left of —2 and a frequency of 3% to the right of +3. Revision ratios such as these, very large in absolute value, occur fairly frequently when the original (revised) forecast was very close to the actual figure.

An example will be found in Figures 3 and 4.[1] Let us first take a look at the lefthand side of Fig. 3, which refers to the monthly development of the selling price plans of Western German leather tanners in the years 1951-1953. The upper curve indicates this development as reported in the survey; the punctuated line, which corresponds fairly closely to the first curve, represents a combination of factors which determine this development (approximately, at least). In this case three such factors come into play, the monthly development of which is indicated under the two curves mentioned above. The first factor is related to the development of the hide dealers' selling price a month before. It is only to be expected, of course, that if the price the tanners have to pay for their raw material rises, there will be a tendency for them to plan an increase in their selling price the following month to cover the resultant rise in their costs. The second factor concerns the tanners' actual selling price the previous month; this is not quite so interesting.[2] The third factor concerns the appraisal of stocks; if the entrepreneur considers his stock of products too large, he tends to plan a lower selling price for the following month in order to reduce the level of his stocks. The shaded area below indicates the degree to which these three factors proved insufficient for the "explanation" of the monthly development of the planned selling prices which form the object of the analysis.[3]

The right side of Fig. 3 deals with the planned selling prices of the Western German shoe manufacturers in an analogous manner; these prices depend, *inter alia,* on the actual development of the tanners' selling prices in the same way as the planned selling prices of this latter group are dependent upon the actual development of the hide dealers' selling prices. Finally, Fig. 4 deals with the determination of the actual selling prices of both groups of manufacturers. Interesting features here are that the appraisal of the stocks plays a rôle here as well (without a time-lag this time) and, further, that the planned selling prices also bring an influence to bear. It is evidently difficult for these firms to deviate from plans made, even if the actual circumstances differ from those anticipated when the plan was devised.

Decision-making in uncertain situations

The analysis of forecasts of various type as roughly outlined in the foregoing sections is interesting, of course, from the academic point of view; it acquires real practical significance, however, only when applied to the problem of endeavouring to arrive at rational decisions in uncertain situations. Thus, as regards the present-day economic policy of the western countries, the matters particularly concerned are the forecasting of the employment situation and of the consequences of measures to stimulate employment. It is also important that the trend of the balance of payments should be estimated and possibly also the effects of measures to improve the balance of payments position. It often happens that these measures conflict with those desirable to combat unemployment, in which case they should be weighed, the one against the other.

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[1] Source: Economic Forecasts and Policy, to be published by the North-Holland Publishing Company, Amsterdam.

[2] It would be preferable to work on the basis of the actual purchasing prices here instead of the selling prices. The survey does not provide any data on these prices, however, so that it is necessary to work with a substitute. This is one of the difficulties with which the econometrician has to contend fairly often.

[3] For a more precise understanding of these figures, it should be known that the numerical values have been arrived at as follows. The firms taking part in the enquiry are weighted according to size, after which the percentages are calculated (per month) of those which report (or predict) a rise or fall or no change. The lines drawn in the figure indicate the monthly differences of the fractions of those reporting a rise and the corresponding fractions of those reporting a fall. If, therefore, the curve lies above its horizontal axis, the reports of a rise predominate. For more details, cf Economic Forecasts and Policy, quoted in footnote 1.

The above is no more than a sample of a whole series of conceivable situations in which one is confronted with a decision which has consequences during a certain period, whereas one cannot clearly foresee what these consequences or the accompanying circumstances will be. One is therefore obliged to make forecasts. Even if one did not accept this and simply based one's decision on the present state of affairs, one would still really be acting on the basis of a forecast, viz., that there will be no change – and this forecast is not always the best. The question then arises as to how one can come to the best decisions in view of the customary flaws in forecasting – which actually amounts to bringing about an improvement in forecasting technique. This is a subject related to what is known in statistics as "decision theory" and one that it is difficult to describe without resort to mathematics. On two points, however, I shall endeavour to elucidate a few of the results achieved.

In the second section of the present article, it was stated that the underestimaion of changes was a regularly-occurring error in economic forecasts. It will be readily understood that this very often leads to inadequate measures being taken. Suppose, for instance, that employment is predicted to decline by 5 %, whereas it afterwards proves to decline by 10 %. It is then evident that the policy-maker concerned, basing himself on the forecast, will have decided on less forceful measures than he afterwards feels were necessary. One can then ask oneself whether it is not advisable to correct the forecasts in respect of this systematic error; for instance, if one has noticed in the past that, on the average, the changes forecast are equal to half the actual changes that take place, whether one should not in future act on the assumption that the changes will be double those forecast. On the whole, such a correction – as can be demonstrated in certain circumstances – is too drastic; it exceeds the optimum. It would, it is true, be a correct adjustment if the underestimation of changes lies at a uniform percentage on all fronts of significance to the policy-maker (employment, balance of payments, etc.); but this is not generally the case and the correction to be made is consequently smaller than the average underestimation. Thus Dutch economic policy in the past years would have done better to base itself on the expectation of greater fluctuations from year to year than those indicated in Fig. 1, though the correction involved is not of dramatic size.

Another aspect of this figure of consequence for decision-making has to do with the unequal variance of the points observed, dependent upon their distancee from the vertical axis. If, that is, one considers those dots which correspond with large actual changes, one notices a greater dispersion in the vertical direction than is the case with the dots lying close to the vertical axis. Nevertheless, despite the greater dispersion (and consequently the larger prediction errors), the forecast of large changes is precisely the forecast that is the most valuable. That is to say, in the case of these changes there is an obvious numerical relationship between forecast and what actually takes place, while this relationship is much weaker in the case of slight changes. For example, if a policy-maker bases his decisions on three forecast changes (unemployment, balance of payments, etc.) and these forecasts are 3, 2 and

5 % respectively, while the actual changes turn out to be 2, –2 and 4 % respectively, then the errors in the forecasts are, indeed, all less than 5 %,[1] but the two series actually display very little resemblance. In such a case, it is advisable to act on the assumption that there will be no change (as can be shown in certain circumstances); thus the forecasts 3, 2 and 5 % are simply substituted by 0 % in each case. Hence, here the increase of the forecast changes referred to in the preceding paragraph is not applicable: if the forecast changes are small, it is advisable to reduce them to nil; if, however, they are large, it may be advisable to increase them still further.

Specialization in quantitative economics at the Netherlands school of economics

When, some years ago, we were considering the matter of adding specialization in quantitative economics to the courses at the Netherlands School of Economics, the general impression was that by so doing we would not be anticipating a small change, but rather that we were, in fact, called upon to respond to large changes which had already taken place, and which could be expected to continue in the future. That is to say, many journals of economics had gradually acquired a fairly pronounced mathematical bias as a result of which a not inconsiderable portion of the articles they published could only be followed by those possessing the necessary knowledge of mathematics. As Professor Tinbergen has already said in the foregoing article, this situation was met shortly after the war by putting mathematics on the first year's syllabus. A few years later, however, this measure was felt to be insufficient, so that it was decided to institute a special series of courses in quantitative economics extending over both undergraduate and graduate study. The accompanying table gives details of these courses. Both the undergraduate and the graduate section of the study cover a period of two academic years; generally speaking, however, the work for the various examinations requires about one year's extra study for each of the two sections, the total period of study consequently lasting for about six years. The first year of undergraduate study is the same as in all the other specialized branches of study at the School of Economics, specialization beginning during the second year. Even then more than 75 % of the total number of lecture hours are still shared with students in the other branches, the rest being devoted to mathematics and statistics. Specialization goes further, of course, in the graduate section of the study, more than 60 % of the time then being spent on lectures and research, specially organized for this group. Generally speaking the quality of the results achieved is very satisfactory, a favourable feature being the tendency of Dutch students not to regard their study as completed after finishing the undergraduate section. The number of students who have shown interest in the course is also reasonably high, i.e., 10 to 20 every year, though this number is, of course, considerably less than the number studying business economics.

H. THEIL[2]

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[1] If a 5% change is to be regarded as small or not depends, of course, on the variable in question. In the case of unemployment, for instance, a change of this magnitude is small; in the case of employment it is not.

[2] Dr. Theil is Professor of Econometrics at the Netherlands School of Economics at Rotterdam.

Survey of Specialization in Quantitative Economics at the Netherlands School of Economics at Rotterdam

	Courses in Quantitative Subjects	Other courses
Undergraduate courses (2 years)	Mathematics: 150 hours (differential and integral calculus, introduction to matrix algebra)	Economics: 350 hours (introduction to economics, money and banking)
	Statistics: 150 hours (economic statistics, regression analysis and time series analysis, introduction to mathematical statistics)	Other courses: approx. 500 hours (business economics, introduction to accounting, economic history, *either* economic geography *or* law)
Graduate courses (2 years)	Mathematics: 120 hours (matrix algebra, differential and difference equations, set theory and special subjects)	Economics: 360 hours (economic theory, money and banking, trade-cycle theory and economic policy, institutional economics, international trade)
	Statistics: 150 hours (probability calculus and mathematical statistics, statistical problems of econometrics, special subjects)	Other courses: 60 hours (Logic and methodology)
	Mathematical economics and econometrics: 240 hours	
	Research: 200 hours	

GROTIUS SEMINARIUM CONFERENCE ON ETHICAL VALUES IN INTERNATIONAL DECISION-MAKING[1]

This article is not intended as an official report on the conference on Ethical Values in International Decision-Making but rather as a preliminary survey, conveying impressions instead of giving an analysis. The Grotius Seminarium Conference must be seen as a study conference, not in the academic sense but as indicative of the participants' strong and serious interest in the topics under discussion. Diplomats, professors, public officials, newspaper editors, many students and people of varied occupations from more than 20 countries attended the conference. A number of papers had been published beforehand. These were:

> "American values and behaviour-patterns and their compatability with peaceful co-existence", by Professor Harold Sprout, Princeton University.
>
> "Living and co-operating in one world in the general context of international relations", by Professor B. H. M. Vlekke, University of Leyden.
>
> "The attitude of the Muslim World", by Professor Anderson, London University, School of Oriental languages,
>
> "The marginal man. His role in history and in future co-operation", by Dr. Kwee San Liat, Leyden.
>
> "International co-operation in the value systems of the Netherlands", by Mrs. H. Verwey-Jonker, The Netherlands.
>
> "Note sur les relations de l'Ethique et de la Coopération internationale dans les Groupes de Culture en France", by Professor Ellul, Bordeaux.
>
> "The ecumenical movement and values in international affairs", by Richard M. Fagley and O. Frederick Nolde, U.S.A.
>
> "Quelques remarques sur le thème 'Living and co-operating in one world' ", by Professor Ludwick Gelberg, Poland.
>
> "The role of education in international ethics", by Professor S. L. Hubert, Wroclaw, Poland.

The papers were designed to lead up to the conference, the conference itself being organized as a discussion-meeting, which pattern was strictly adhered to. Discussion took place in three sections, dealing with the Western countries, the Communist countries and the countries of Asia and Africa. The first day dealt with:
"The impact of ethical values on the motivation of the individual in his public role", the second with "Ethical values underlying regional integration", while the topic of the third day was "Ethical values and the rate of social change".
On Monday, June 16th, the address of welcome was made by the Chairman of the conference, His Excellency, Dr. C. W. A. Schürmann, Head of the Netherlands Permanent Mission to the U.N. in New York, followed by the opening of the

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[1] The Conference took place in The Hague, June 16–19, 1958, and was supported by Fraternité Mondiale, the Prins Bernhard Fonds, Nuffic and several other organizations.

conference by His Excellency Dr. E. H. van der Beugel, State-Secretary of Foreign Affairs, acting for his Excellency Mr. I. M. A. H. Luns, the Minister. An address was then given by Professor G. H. J. van der Molen on the topic of the conference. The musical interludes provided most capably by the Röntgen Quartet were a much-appreciated innovation that can be recommended for use at all international meetings, in view of the soothing influence of music on the "international mind". The opening of the conference was already characterized by a very warm and friendly atmosphere which continued throughout the following days and which enabled everyone to be himself and to speak as an individual, without afterthought. Thus the ethical value of a meeting which cut through the various layers of international society was definitely proven.

The conference had no other purpose but to bring about better understanding and to clarify concepts that are very frequently used, but very differently interpreted. The drafters of the program, taking the view that ethical values occur in the sphere of the individual, in the action-patterns of states and regional groups and in global society, had assumed that it would be particularly the interaction between individual, state and global ethics which would form the main topic of discussion.

Things turned out rather differently, however, which in itself proves that the conference was of dynamic rather than of static character.

The belief that if the ethical realm of the individual was defined concretely, there would not be too much divergence among the various civilizational groups was not borne out. Instead, a strange anomaly in modern thinking came to light: all groups were willing to agree on the basic unity of human nature, yet they were not prepared to draw any concrete conclusions from this basic assumption.

This result is a highly significant one: the image of Man does not differ in the dominant civilizations as far as his basic structure is concerned; the differences exist in regard to the purposes of his development. Yet structure and development must be related to one another and, although it was obviously not within the scope of the conference to go deeply into this highly complex problem, it was nevertheless of great importance that it came so clearly to the fore.

To put it in the language of the conference: the realm of individual ethics cannot be defined sharply or concretely because of the very different weight of social ethics in various stages of social development. Every social group goes through an initial stage in which group goals dominate over private goals, or to express it in the terminology actually used: social ethics dominate over individual ethics. Only after a certain development has been achieved – economic as well as other development – can the individual sphere be set off clearly and defined in legal as well as ethical terms.

In other words, various stages of social development display a different relationship between individual and social ethics, and great confusion results from the fact the same terms are used when they have a completely different social and emotional connotation.

This came out very clearly in regard to concepts like national sovereignty and national self-determination. In the western world, the ethical value of these terms is felt to be ambiguous. A certain abandonment of sovereignty in favour of regional or world integration seems to many ethically positive; in the section on Communist thinking it was pointed out that adherence to the notion of legal sovereignty counteracts supra-national power-tendencies, while in the third section it was felt by some participants that integration beyond the national limits would hamper free decision, which is essential for the achievement of national identity. One term, but three differing ethical interpretations, which can only be reconciled by admitting that the interplay af the various ethical values – in his case national and global ones – is fluid. Nevertheless, the three spheres of ethical values – individual, national and global – all meet in the individual. It is the individual who strives after his own fashion for his happiness, or it is this happiness, which furnishes or should furnish the motives for action by governments, while global ethical values simply mean that all people of this earth should take into consideration the relative well-being of all other people, when making decisions.

It is, however, not only the individual *hic* and *nunc* who determines social action, but also the many generations before him and those coming after, which bring a weight to bear that cannot be ascertained concretely. Mature civilizations think in terms of the individual; new social groups, however old their civilizational beginning might be, give greater weight to group goals.

"And never the twain shall meet?" one may ask. Not necessarily, though there was a marked difference between moderate, hesitant well-seasoned views on European integration and the views of those who think of integration as a political goal and as a method to achieve socio-economic power. But – as was pointed out so rightly – power is only ethical if it serves the individual, but as soon as it dominates the individual, it becomes ethically negative, as future group-interests should not weigh too heavily on the present. In terms of giving priority to group ethics or individual ethics, a danger is that group-ethics can mask the striving for power; actually, many social groups would have to utter a "peccavi", if history were viewed dispassionately in this respect.

The interaction between individual ethics and social ethics should be constructive, flowing from the individual to the community rather than vice versa. And that the nature of the individual is seen too one-sidedly in the western world,[1] who spoke as follows:

"We in India are convinced that man must live with his true nature and that true nature, while it is no doubt related to mundane matters, has also, however, very clinging ties with the reality of spiritual values. These spiritual values are matters for constant experimentation and discovery in a spirit of humility. India's long experience in such philosophical and religious contemplation has proved to us that man can never be independent. He must be interdependent with his fellowmen and must lean heavily on that spiritual force that will fill him and guide him so long as he performs duties without ulterior or selfish motives."

Thus, any ethical system can only be truly ethical insofar as it is rooted in the individual. It is the individual who makes the good and evil of society, and it is only the individual who can give room to altruistic motives. But altruism in the twentieth century means o see the world realistically and simply as a planet inhabited by two and a half billion people who are striving for comparable forms of happiness on the basis of the fundamental unity of their nature. The ethics of the twentieth century have to come from within the individual and cannot and should not be superimposed or devised purely in the form of social ethics, at least, not as an ultimate goal.

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[1] From the speech delivered at the conference by Shri John A. Thivy (Ambassador of India at The Hague).

On these and comparable topics, frank discussions went on for three days. And the result?

No resolutions were passed, no learned formulae devised; but many participants felt that an opportunity had been provided to express oneself and to gain more understanding of others' thinking.

B.LANDHEER [1]

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[1] Dr. Landheer is Director of the Library of the Peace Palace in The Hague.

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CHRONICLE

INSTITUTIONS

The Netherlands Economics Institute

Information: The Netherlands Economics Institute, 118, Pieter de Hoochweg Rotterdam.

The Netherlands Economics Institute was established in 1929 with the object of providing facilities for undergraduates and graduates of the Netherlands School of Economics to gain practical experience in scientific research work in economics. Hence the Institute – although otherwise an independent scientific body – was accommodated in the building of the Netherlands School of Economics from 1929 to 1957. In the latter year, however, it moved into a building of its own next to the School of Economics. In accordance with its special organization, the affairs of the Institute are conducted by a number of directors, who are at the same time professors at the Netherlands School of Economics. At present the directorate is composed as follows: Prof. Ch. Glasz, Prof. L. M. Koyck, Prof. H. W. Lambers and Prof. J. Tinbergen. The General Secretary is Mr. J. R. Zuidema.

In 1932 the weekly, "*Economisch-Statistische Berichten*" (Economic Statistics Bulletin), which was founded in 1917, was taken over by the Institute, which thus acquired a journal of its own. This weekly, which is also distributed in Belgium, is undoubtedly the leading economic journal in the Netherlands.

After the war, a change was effected in the organization of the Institute in that it was decided to endeavour to finance the work with the proceeds of research work done on behalf of third parties for payment, in addition to the income derived from the subscriptions to the Economic Statistics Bulletin. This meant that an attempt was made to run the Institute without grants and to make it self-supporting. The first few years after the war were needed to create a market for this type of work. As the research work is generally carried out on an econometric basis and invariably has a marked quantitative character, both industry and government circles required some time to get used to the novel aspects of the institute's work. About 1950, however, the home market for the Netherlands Economics Institute had been established, and numerous concerns and government bodies became its regular customers.

In the years after 1950 the economic research work of the Institute underwent a further change to the extent that the foreign aspects – partly in the form of orders from Dutch concerns for analyses of foreign markets and partly in the form of orders from foreign customers – gradually became a permanent part of its programme. Collaboration with economic institutes and authorities abroad also resulted in an intensification of this type of work.

In addition to research for third parties, the Institute also carries out research into subjects which are considered of general importance, the results being published in the Economic Statistics Bulletin or in monographs.

Early in 1955 a new department was added to the Institute, which specializes in the study of problems relating to the development of underdeveloped areas. This department is known under the name "Division of Balanced International Growth" (B.I.G.) and works under the direction of Professor J. Tinbergen. The subjects studied in the department are of an economico-statistical nature and originated in part from the problems of programming development, as also encountered by the World Bank in assessing applications received from underdeveloped countries.

Figures are collected and analyzed in respect of the capital required for establishing concerns in various branches of industry under different conditions; methods are worked out for assessment of the national-economic value of investment projects; investigations are made to establish the most efficient manner in which the countries concerned can utilize their resources and into the stabilization of the prices of raw materials.

The personnel of the Netherlands Economics Institute now numbers about 55, of which 45 are on the scientific staff. Most are graduate economists, but the staff also includes an agricultural engineer, a sociographer and a sociologist.

Activities and research in the international field

1. Department of General Economic Research. As a matter of fact, most research projects and investigations carried out in the General Economic Research Department of the Institute display one or more international aspects.

Among the investigations of a predominantly international character were the following:

- A forecast of world supply of and demand for nitrogen fertilizers.
- An investigation concerning the world market for sugar and the possibilities of increasing sugar consumption.
- A quantitative analysis of the substitution between fuel oil and coal in Western Europe and of the factors determining this substitution.
- A regular forecast of business activity in the United States.
- Investigations regarding the influences of the European Common Market on some important industries (textile industry, tobacco manufacturing industry etc.).
- Analysis of the potentialities for economic development of Curaçao, one of the islands of the Netherlands Antilles.
- A comparative study of real incomes of pilots employed by important Western European airline companies.

Of these studies some were made on behalf of important international organizations (both public and private) and others for large private firms with extensive international interests.

2. Division of Balanced International Growth. The B.I.G.-division is internationally orientated. Besides the Dutch members of the staff, there are a number of foreign visitors. These guest members are mostly economists from underdeveloped countries, staying in the Netherlands for some time to complete their studies or to carry out investigations on subjects in which the Dutch have a considerable amount of experience. Some visiting economists participate in research projects. In spite of the relatively small size of its staff, there is a great variety in this department's research projects. Among the reports published are:

- Capital-labour ratios of certain industries in various countries.
- Subsidies and the substitution of labour for capital.
- The economics of mill versus handloom weaving in India.
- Alternative techniques of production (several case studies).
- The terms of trade between agricultural and industrial products.
- The appraisal of investment projects.
- Second-hand machines and economic development.
- The development of offshore fisheries and the economics of choice.

At present, part of the research work is being devoted to the elaboration or generalization of the above-mentioned studies. Other projects on hand are the construction of an econometric model of the Egyptian economy and a model for describing industrialization in general; a study of the directives for the organization and operation of state enterprises; and a study of industrial estates as a device to promote small industries.

All reports are published in English. In addition, there is a reprint series of articles on development problems. Reports and reprints can be ordered from the department.

Another important aspect of the activities of the B.I.G. division consists of advice furnished to foreign governments, *inter alia* to Italy (Vanoni Plan), Mexico, Pakistan, India, Egypt and France (Algeria), which advice was mainly given by Prof. Tinbergen personally. He also advises the U.N. (on SUNFED) and the G.A.T.T.

Numbers are often used to present certain types of information in its most condensed form. Applying this method to illustrate the international scope of the B.I.G. division's activities, it can be said that its mailing list contains addresses in some 45 different countries.

INTERNATIONAL COURSES

Six-month course on social welfare policy for low-income countries

The Institute of Social Studies has organized a six-month course in Public Administration for some years now, besides a six-month course in Economic Planning, which was given for the first time in the academic year 1956/57. The past academic year saw the launching of a third six-month course, a course on "Social Welfare Policy for Low-income Countries".

The basic idea of this course had grown out of the conviction that social welfare policy needs reconsideration and reformulation in order to meet the special needs of low-income countries in process of rapid development. "Social policy" was taken in its widest implications, covering social work, social welfare action, "assistance sociale" and such social services as education, health services and housing. The course, as was emphasized by the introduction to it in its first calendar, was not intended to provide for specialization in the traditional sense: its leaders were more interested in seeing that the participants should acquire wider vision than in turning them into specialists.

The course opened on 18 September 1957 with seventeen participants, selected on the basis of their academic qualifications and/or their practical experience, and coming from a wide variety of countries and regions (two from Ghana, one from Tanganyika, five from India, one from Egypt, one from Lebanon, one from Jordan, one from Israel, one from Greece, one from Hongkong, one from Surinam and two from Holland).

During the first term (18th September–10th December) classes and seminars were arranged around the central theme of community development. Modern methods of social work were studied in order to see how they could be applied in a community development setting, and various fields in which the whole idea of community development is particularly important, like health, nutrition, education, were given special attention.

In the second term (10th January–2nd April) broader issues were given consideration, like the function of trade unions in a general welfare policy, the co-operative movement, the relation between social and economic policies; the general theme of this second term was "social planning". Both terms were ended by a seminar, to which the students themselves made a large contribution.

This is not to say that their participation in the other classes was confined to patient listening. The group proved to be quite active from the very beginning and discussion was hardly ever lacking, inside or outside the classrooms. Participants were, on the whole, quite capable of communicating something of the general atmosphere and special problems in their own countries to others, translating the sometimes rather theoretical issues treated in class into more concrete terms and showing what such questions would look like in an African, Middle Eastern or Indian setting. This was stimulated by the formation of small regional discussion groups, which worked, fairly well, especially during the first term.

It was to be expected that students following this course, many of them being social welfare officers who had themselves studied and organized concrete and very practical services, would like to complement the academic part of their study in Holland by closer contact with the actual work of different social services in this country. The course consequently provided for an observation period of one month, lasting from 10th December to 10th January.

A programme was arranged for each student individually, according to his or her special interests. In these weeks, participants could be seen in Dutch factories, talking to the personnel, the manager and the industrial social workers; they went – in temperatures below zero !– to the North of Holland to see more of the development work being undertaken over there; one Indian participant made a special study of the social work done in Dutch hospitals etc. etc. But the stimulus given by contacts with Dutch workers in the field proved to be so great and the reception given to our students by these Dutch workers and organizations so cordial, that many extra working-visits and short trips were made, either with the whole group or by students individually.

Classes, seminars, conversations, field trips and the writing of the final "long paper" eventually led to the closing session and the award of diplomas on April 2, 1958.

One certainly cannot say that the course has found its final, perfected form. One can, however, conclude from the results of the first year that its main principles have proved workable, that it does fulfil a need, and that the Institute will, in the coming years, give a ready welcome to new groups of people whose interest and experience contribute to insight into the features and inter-relationships of those special services which together form a social welfare policy.

Meanwhile, the second course began on September 1st, 1958.

International course on "Materials Handling and Management"

From September 29th to October 10th, 1958, under the patronage of the European Productivity Agency, the Research-Institute for Management Science (formerly: Foundation "Training Courses and Research") will organize a two-week seminar course on the subject of "Materials Handling and Management". The Institute will incorporate the results of its research in the field of materials handling and its relation to industrial management in this course. It will be held in Delft, The Netherlands, and will be conducted in the English language.
It will be of particular interest to
- works-managers, managers of materials handling departments and materials handling specialists
- manufacturers or sales-agents of materials handling equipment
- management consultants
- instructors at technological universities and colleges.

The course will cover the following subjects:
- analysis of materials handling costs
- materials handling techniques
- classification, analysis and solution of materials handling problems.

The enrolment fee will amount to Dfl. 800,— (approx. US $ 210 or £ 80), not including board and lodging.
Registration should be effected before September 1, 1958 at the Foundation "Training Courses & Research", 76, Nieuwe Laan, Delft, The Netherlands.

INTERNATIONAL SCIENTIFIC MEETINGS

150th anniversary celebrations of the Royal Netherlands Academy of Sciences and Letters

The celebration of the 150th anniversary of the Royal Academy, which took place from May 6 to May 9, 1958 in Amsterdam, the programme of which was announced in the December 1957 and March 1958 numbers of this Bulletin, attracted a considerable amount of attention both at home and abroad.[1]
Fifty foreign guests took part in this celebration, representing 45 sister academies in 25 countries on both sides of the iron curtain and including Japan, South Africa, the Vatican and the USSR. The address on behalf of the foreign academies was delivered by the delegate of the oldest institute of all, the historian of theology, Professor Raffaele Pettazzoni of the *Accademia dei Lincei* (of the Lynx) at Rome, which was founded in 1603.
The addresses on the subject of "Certainty in the Sciences" were attended by H.M. Queen Juliana. During the special concert organized for the occasion by the *Concertgebouw Orkest* under its conductor, Eduard van Beinum, performances were given of works by two of the Academy's former members, Mendelsohn and Beethoven, also the first performance of a recently completed work by Guillaume Landré, entitled "Symphonic Permutations".
This year's President of the Royal Academy, the classical scholar, Professor B. A. van Groningen, pointed out that it was only now, 150 years after its foundation, that the Academy was appearing before the forum of the world. He emphasized that the fate of science is always influenced by the general situation in the country and the world and that in a period of unrest such as we were now experiencing, great responsibilities rested on the shoulders of the scientists. "Fields which we have trodden for centuries," the speaker concluded, "suddenly reveal the most astonishing perspectives. Specialization often assumes almost alarming proportions . . . It is realized everywhere that to a not inappreciable extent man's future – material and spiritual – will depend on what science produces. The possibilities are enormous. And so are the dangers. Mankind, must live but it must also live well. Both are only possible, if science, too, performs her duty . . . Everywhere where unity threatens to be lost under the pressure of the multitude of things, everywhere where co-operation and co-ordination are necessary or desirable, whenever equilibrium is in danger because a particular group of sciences begins to predominate over the others, and there, too, where even our very high degree of specialization still leaves an impermissible lacuna – in all these cases the Academy must fill the breach. I can only say that she is ready to devote her best resources to the fulfilment of this task."

After the speech by the President, the gathering was addressed by Dr. J. M. L. T. Cals, the Minister of Education, Arts and Sciences, who praised, among other things, the plan put forward some years ago by the Academy to set up science councils. These councils will be set up for the various branches of science and will exist in an organic relationship to the Academy.

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[1] For the presentation of the Lorentz medal to Professor Lars Onsager of Yale University, see the "Miscellaneous" columns of this issue.

"I am convinced," said the Minister, "that the chance of success will be all the greater the more these councils concern themselves with questions of fundamental policy in science. It is hardly necessary in this illustrious gathering to emphasize that such questions are of decisive importance, in our day particularly. The urge to specialize and the tendency for science to make itself not only useful but also subordinate to the development of society threaten to sever it permanently from its fundamental principles. Specialization must not be allowed to degenerate into the immoderate and unbalanced cult of special subjects. The inner relationship, the organic unity of the sciences must not be lost... The first contribution the science councils can make is an outline of the evolution of science, of essential significance to science itself. But this will at the same time mean a highly significant contribution to the interests of society as well".

LIBRARIES AND MUSEUMS

The national folk-lore museum "The Netherlands open air museum" at Arnhem

Introduction

There is something refreshingly paradoxical about the expression "Open Air Museum", and the fact that in such a museum the collections are arranged in the open air – and as far as possible in their natural, organic relationship – represents an advantage over other types of museum.

Since, however, the expression only indicates *where* the objects concerned are to be found, and not *what* they are, the official name of the Netherlands Open Air Museum is the National Folk-Lore Museum. Its aim is: to foster the study of rural culture in all parts of the Netherlands, as expressed in houses, lay-out of villages, local dress, household furnishings, tools, etc., and to collect, preserve and exhibit objects of this nature.

History

The original home of the open air museum was Scandinavia, where even as early as the 17th century more interest in rural culture was being shown than elsewhere in Europe. The rapidly increasing disappearance of local customs and dwellings as a result of industrialization and urbanization gave rise to an endeavour to preserve rural monuments of cultural and historical value for future generations, and to arrange them on a given site in the same way as they had formerly existed in their original surroundings, as far as this could be achieved. The founder of the first open air museum was a Dr. Hazelius, a Swedish philologist with a pronounced love of folk-lore. In 1892 he founded the open air museum at Skansen, near Stockholm, as an extension to the celebrated Nordiska Museum. In the Netherlands, after Frédéric Adolphe Hoefer, an archaeologist from Sittard and later a general, had made a journey through Scandinavia to study the open air museums there, the Association known as "The Netherlands Open Air Museum" was set up on April 24, 1912. The municipality of Arnhem lent its wholehearted support to this important and bold enterprise by leasing the splendid estate near Arnhem, known as "De Waterberg", to the new Association.

In July 1918 the Netherlands Open Air Museum was opened for the first time to the public and its first – still rather modest – acquisitions put on exhibition. The Association was obliged to carry out its difficult task with limited means, derived from contributions by its members and later from a few subsidies from the State, the provincial and the municipal authorities. That the collection continued to expand, despite constant financial difficulty, was due to the untiring efforts of the museum's founder and his successors to achieve the ideal of a representative national museum of folk-lore for the Netherlands.

Shortly after its opening the museum already had on exhibition: a *los hoes*[1] and bakery from the region of Twente, in the eastern Netherlands, a mill from the Gooi district, on the Zuyder Zee, east of Amsterdam, a Volendam fisherman's cottage and a turf hut from the province of Groningen in the north. The following figures clearly demonstrate the museum's vitality: in 1924, 1937, 1946 and 1957 there were 20, 35, 43 and 85 exhibits respectively on show on the museum site. In 1942 the museum was taken over by the State and from then on became known as the National Folk-Lore Museum. Since the Government proved willing to spend considerable sums on the work, it proved possible for the museum to

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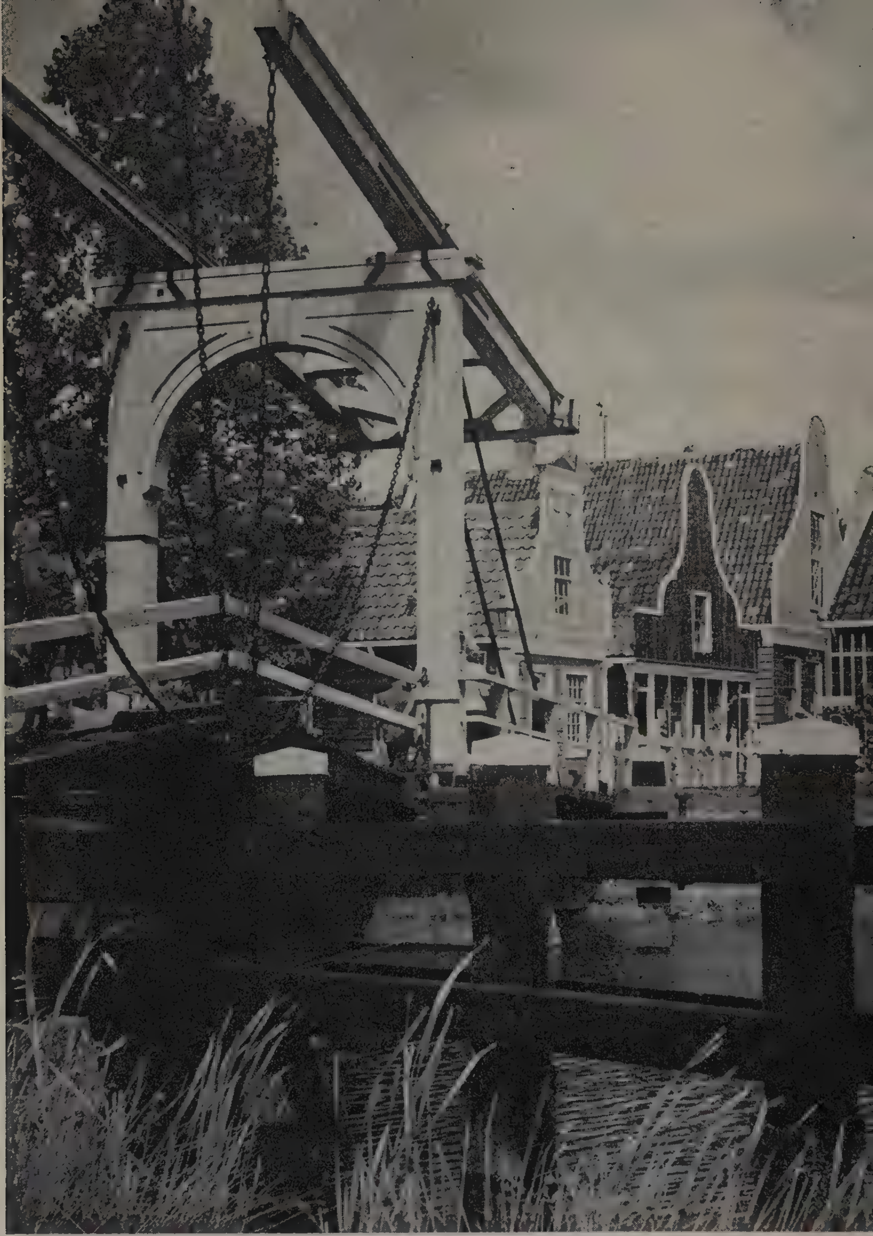
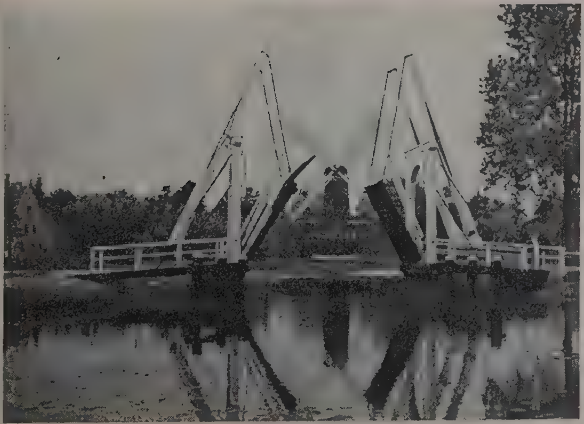
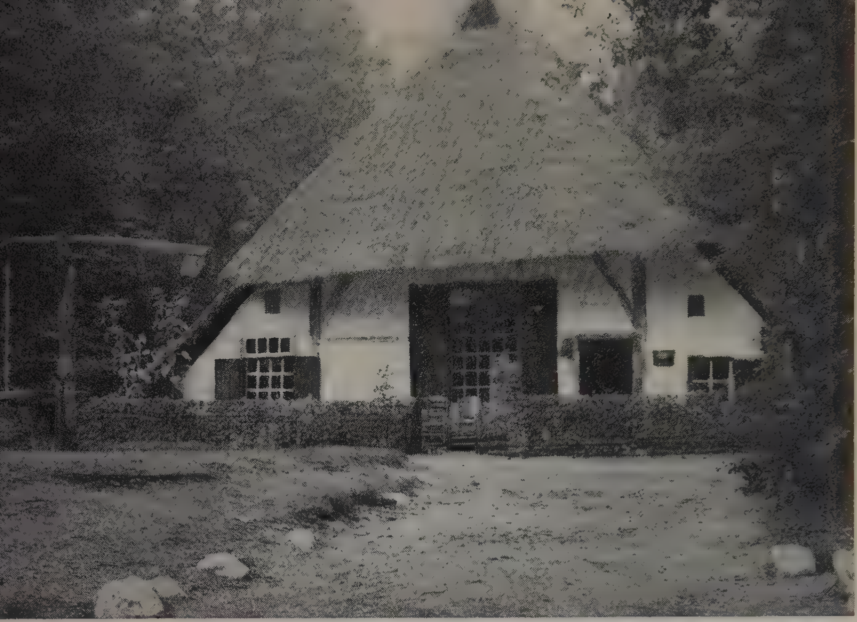
[1] A *los hoes* is a farmhouse – now no longer in use – in which the farm people lived with the livestock in one room.





▲
ZAAN DISTRICT *(province of North Holland) Small street with wooden façades, second half of 18th century. The drawbridge in the foreground comes from Ouwerkerk on the River Amstel.*

◀ OUWERKERK ON THE AMSTEL *(province of North Holland)*
A side view of the bridge in fig. 4, showing clearly the way the double drawbridge operates. In the background a wooden sawmill known as a "paltrokhoutzaagmolen", a type invented in the Netherlands at the end of the 16th century, only four of which have been preserved. The mill seen in this photo comes from Numansdorp in the province of South Holland.



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LICHTENVOORDE *(province of Guelderland)* *A "los hoes", in which living quarters, cattle-stalls and threshing-floor form an undivided whole, where humans and animals live together. This type of farmhouse has now become obsolete. The projecting roof prevents squalls of rain from washing away the loam from the walls and the opening ventilates the hay in the loft. At the top the "uilengat" (owl hole) can be seen. In former days it was believed that an owl nesting in the farmhouse protected it from illness, accident and fire. (Photo: Netherlands Open Air Museum)*

STAPHORST *(province of Overyssel)* *Farm kitchen with tiled walls, painted decorations, colourful furniture and a large open hearth with chimneypiece.*

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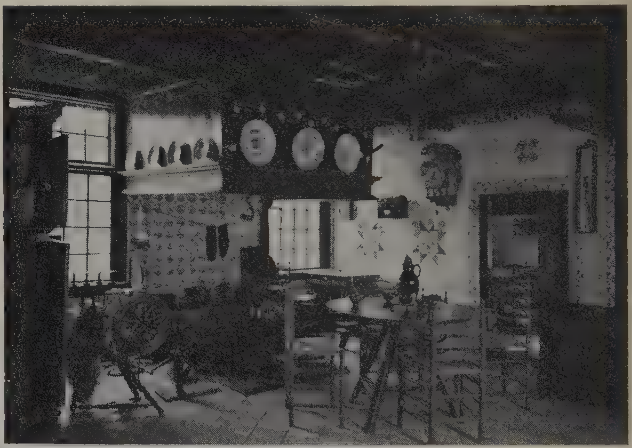

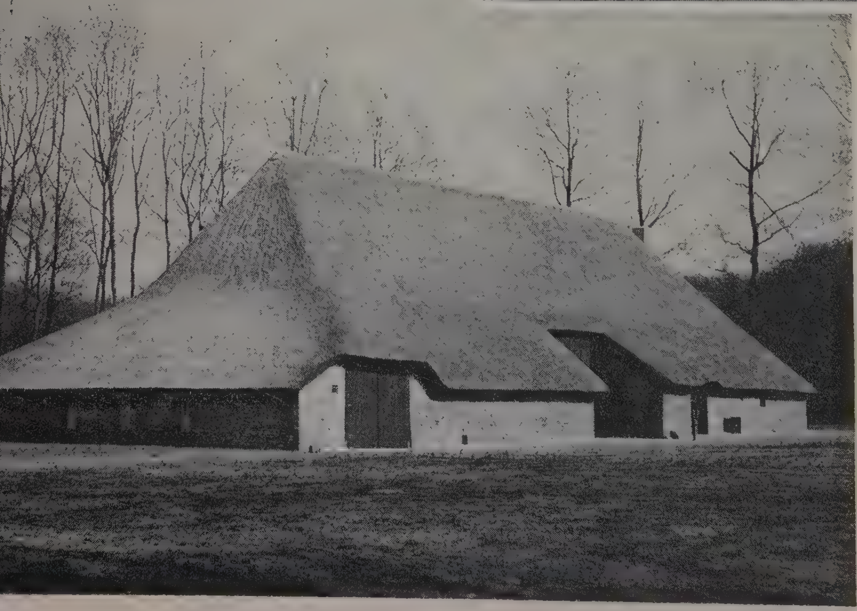

◀

LAND VAN VOLLENHOVE *(province of Overyssel)* *A cross between the arable and the cattle farm type of farmhouse. The living quarters are on the other side. The hay-waggons enter through the large door in the long façade. The entire roof is made of reed.*

give more attention henceforth to scientific and cultural matters.

1944 was a year of disasters for the hitherto flourishing museum, and a very large number of objects, some of them irreplaceable, were lost or irreparably damaged as a result of the ravages of war, theft and vandalism. After the war, however, the work of rehabilitation was taken in hand with new courage and the list of acquisitions expanded.

In 1948, in which year another folk-lore museum, the National Zuyder Zee Museum, was opened at Enkhuizen, a port on the former Zuyder Zee, the work was divided between the two museums, the task of each being clearly defined.

Since that time work has gone on at a relatively rapid pace to give the museum more definite form, an absolutely indispensable requirement. The new headquarter building, where the scientific, documentary and office work is done, the costumes pavilion, the new museum restaurant and the hall for lectures and congresses are the result.

Collections

The site of the museum, extending over an area of about 80 acres, at present contains farms, mills, rural industries, dwellings, all of which have been arranged as far as possible according to province and set in their own natural surroundings, with the appropriate furniture and tools, etc. The park also comprises a herb garden, sites for the exhibition of rural conveyances, costumes and miscellaneous temporary exhibitions. The scientific collections at present comprise: 13,000 books, 70,000 photographs, 50,000 negatives, 5,000 lantern slides, 33,000 miscellaneous objects and a large series of documentation reports on folk-lore and popular arts and crafts.

Activities

Dismantling of typical rural buildings from all parts of the Netherlands and re-erection in the museum; collection of regional costumes, furniture, tools and conveyances and the registration and documentation of obsolete and still existent examples of rural culture.

Visits to the museum

Interest in the museum has increased, particularly since the last war, as evidenced by the following figures relating to the number of visitors: 1946: 65,000; 1950: 129,000; 1955: 235,000; 1957: more than 271,000. Of these the number of foreigners is estimated at 12 to 15%. During 1957 more than 17,000 visitors from the Netherlands and more than 4,500 foreigners made use of the services of the guides employed to show people round the museum.

Information

For information concerning the scientific collections, visits to the museum and the guide service one should apply to the following address: RIJKSMUSEUM VOOR VOLKSKUNDE "HET NEDERLANDS OPENLUCHTMUSEUM", 89, Schelmseweg, Arnhem. Tel: Arnhem 22047.

MISCELLANEOUS

Honorary Canadian doctorates for H.R.H. the Prince of the Netherlands

During his visit to Canada in May last, H.R.H. the Prince of the Netherlands, Honorary Chairman of NUFFIC, was awarded honorary degrees of Doctor of Laws by the universities of Montreal and British Columbia.

University of Leeds honours prof. O. Bottema of Delft

The honorary degree of Doctor of Laws the University of Leeds has been conferred on Prof. O. Bottema, the mathematician and Rector Magnificus of the Technological University of Delft.

Dr. Bottema was presented for the degree by Prof. Cox, Professor of Inorganic and Structural Chemistry at the University of Leeds, who made the following speech at the ceremony:

The Netherlands has a long tradition of happy union between the things of the spirit and the affairs of daily life. No better representative of that tradition could be found today than Oene Bottema, Rector Magnificus of the Technological University of Delft, like the great Stevinus, a pure mathematician finding inspiration in technology, and, like the Brothers of the Good Life in Deventer long ago, scorning the idea that the world owes a living to the elect. Fellow rectors and vice-chancellors well may marvel at a man on whom years of chairing a Senate containing no less than twenty-one pure and applied chemists have apparently left no scar. Does the secret lie in a marked Carrollian streak which enables him to escape for recuperation at will in a Wonderland where, after his known researches on the play-element in mathematics, he is perhaps secretly writing an essay on the academic sublimation of blood-sports?

Dr. Bottema stands before you today as the representative of an institution which has many affinities with the University of Leeds. Like Leeds it has roots in the early nineteenth century, and celebrated its jubilee as a university a few years ago; it is much the same size; but especially we have a feeling of kinship for it because it was, until this year, the only technological university in the Netherlands, and many of its problems, stemming from the national demand for scientists and technologists, are very much our problems.

There are perhaps no greater difficulties in a modern university than those of reconciling the need for continuity of administrative policy with the jealously guarded tradition of academic freedom, and of finding the presiding genius who can provide the one without infringing the other. Delft, like Leeds, is happily untroubled by these difficulties. In 1949 she boldly abandoned the tradition of short-term rectorships, and, alone among the Dutch universities, now has a permanent Rector. Delft's reputation in the world of pure and applied science has never stood higher than it does today, seven years after Dr. Bottema assumed that great office, in which he enjoys the affection and esteem of his own Senate, and the respect of academic people everywhere.

Honorary Dutch doctorate for Professor Dumon of Louvain

During the celebration of the eighth lustrum of the Agricultural University at Wageningen, an honorary doctorate was conferred on Professor A. G. Dûmon, of Louvain, for his outstanding services to science, especially in the field of the improvement of cereals, market gardening crops and chicken breeds.

Honorary Greek doctorate for Professor De Waele of Nymegen

On the occasion of the 24th lustrum of the University of Athens, an honorary doctorate in the faculty of philosophy was awarded to Professor F. J. M. de Waele of the Roman Catholic University at Nymegen. Professor de Waele teaches the history and political systems of the Greeks and Romans, classical archaeology and Modern Greek. He has done important archaeological work in Greece and contributed much to the relief of the areas struck by earthquake disasters. He has also been a guest lecturer at the University of Athens.

Lorentz gold medal for Professor Lars Onsager of Yale University

On May 7 last, during the celebration of the 150th anniversary of the Royal Netherlands Academy of Sciences and Letters, the Lorentz Gold Medal was awarded for the seventh time since its institution in 1925. On this particular occasion the award was made to the American scholar, Lars Onsager, Professor of Theoretical Chemistry at Yale University, for his use and development of mathematical methods for solving problems in physics and chemistry. His work displays unmistakable links with that of Lorentz himself and of two other Dutchmen, Debye and Kramer, both of whom were former recipients of the award. The medal was handed over by the Dutch Nobel Prize Winner, Professor F. Zernike, of the State University at Groningen, to the United States' Consul-General in Amsterdam, since Professor Onsager had at the last moment been prevented by illness from making the journey to the Netherlands.

William Bowie medal for Professor Thijsse of Delft

The William Bowie medal, which has been awarded annually since 1939 by the American Geophysical Union to a prominent geophysicist, has been awarded this year to Professor J. Th. Thijsse, of the Technological University at Delft, during the Union's recent annual meeting. Two Dutchmen now figure among the few foreigners to whom this singular honour has been accorded, since the same medal was awarded, in 1947, to the well known geophysicist, Professor F. A. Vening Meinesz.

The name of Professor Thijsse, who is now 65 years old, is identified in the Netherlands and abroad with the evolution of science on behalf of hydraulic engineering. He began his career as an assistant to that great engineer, Lorentz, in drawing up the plans for the enclosure and drainage of the Zuyder Zee, and played the leading rôle on the scientific side of this work. In 1927 he assumed the management of the Hydraulics Laboratory at Delft, which has since become world-famous. In 1938 he accepted a chair at Delft University, his inaugural address being on "Theory and Experiment in Hydraulics". He had a great share in the redrainage, after World War Two, of the flooded island of Walcheren and, later, in the reclamation work after the Flood Disaster of 1953.

Professor Thijsse is Chairman of the Faculty Committee of the International Hydraulics Course, organized in 1957 by the Technological University at Delft and NUFFIC, which course is at present being attended by 45 engineers, coming from twenty different countries.

Professor Geyl takes leave of Utrecht

On May 31 last, Professor Pieter Geyl delivered his farewell lecture at the State University at Utrecht, having reached the age of seventy on December 15 the previous year.
A historian, Professor Geyl studied at Leyden from 1906 to 1912, after which he took up a teaching appointment in Schiedam. In 1913, however, he became the London correspondent of the Nieuwe Rotterdamse Courant. Six years later he became a professor at the University of London, and in 1936 was appointed to a professorial chair in the State University at Utrecht. Professor Geyl is well known as a historian throughout the Western world and occupies a place apart in the Netherlands as a writer on history. His work, *De Geschiedenis van de Nederlandse Stam* (History of the Netherlands Race) has brought about a fundamental change of view with regard to our national history. His view that it was not natural differences but strategic factors which brought about the schism between the northern and southern Netherlands in the 16th century has been accepted in its entirety and generally. This work of his already bears witness to Geyl's conviction that at every juncture in human history there are various ways in which events can develop – there is no such thing as absolute inevitability.

Geyl joins battle briskly with the builders of systems, like Toynbee, who attempts to force the multiplicity of historical happenings into the strait jacket of an *a priori* system. He prefers to be a historian of uncertainty, an eternal explorer, rather than a subjective "architect", subordinating objective facts to a system. Geyl's international reputation was widened by his discussions with Toynbee, *inter alia* in "Pattern of the Past", and many of his works enjoy wide circulation, particularly in the Anglo-Saxon world. He has given lectures at Harvard University, among others, and was awarded an honorary doctorate by St. Andrew's University.

There can, of course, be no question of discussing all Professor Geyl's works (for which, by the way, he was recently awarded the P.C. Hooft Prize, an important literary distinction in the Netherlands) in the short space available here. The award of the P.C. Hooft Prize, however, once again underlined the fact that Professor Geyl is no narrow specialist, but a literary man who breaks through the boundaries of specialization. We know him as a poet from his collection of sonnets, entitled "Het Leven Wint Altoos", which was published in Holland recently.

Professor Geyl will continue to be appreciated by his students not only as a man of learning but also as their tutor, the professor whose prime aim was not to equip them with a body of knowledge but rather to teach them how to think historically. By his personal contacts with his students he has stimulated many of them to take part in the "discussion without end", which comes the closest to historical reality.

Netherlands Institute at Istanbul opened

A short time ago the Netherlands Historical and Archaeological Institute was opened at Istanbul by H.R.H. the Prince of the Netherlands. The Institute, which has been arranged by the Netherlands Near East Institute at Leyden, is housed on the first floor of the *Palais de Hollande*, a 17th century edifice which was the Netherlands Embassy in the former Turkish capital. The foundation of the Institute has been made possible by the co-operation of Dutch ministries and the Dutch business world.

Five new foreign members of the Royal Netherlands Academy of Sciences and Letters

Five nominations to membership of the Royal Academy were recently approved by royal decree. The list of names and the reasons which moved the Academy to make these appointments are as follows:

Dr. Joachim Jeremias, of Germany, is a professor at the University of Göttingen, giving instruction in the New Testament. During the Nazi period he was a member of the "Bekennende Kirche". Professor Jeremias has brought an increasing influence to bear on New Testament research, particularly in the last decade, in Germany and outside that country as well.

Prof. A. van Loey, of Belgium, is a leading expert on the Low Countries and has given evidence of great knowledge and energy, coupled with a seldom-erring accuracy, in numbers of publications.

Dr. Alfred Tarski, of the United States, is professor of mathematics in the University of California. Both prior to the war, when still in Poland, and later in the United States, he has formed around him a wide circle of mathematicians and philosophers.

Dr. Melvin Calvin, of the United States, is professor of chemistry in the University of California. He has made highly important contributions in the field of organic chemistry in the widest sense of the word. By virtue of his versatility he has been able to put forward basically new points of view, both in the field of physical and theoretical organic chemistry and in those of general organic chemistry and biochemistry.

Dr. W. Pauli, of Switzerland, is professor of theoretical physics in the Confederation's Technical University at Zurich. His merits in the field of theoretical physics have acquired wide fame. After having received the Lorentz medal from the Royal Netherlands Academy of Sciences and Letters, he was awarded the Nobel Prize for physics in 1945.

Honorary Doctorate in Delft for Sir John Cockcroft

The Senate of the Technological University at Delft has decided to award the honorary degree of doctor in technical science to Sir John Cockcroft of the Atomic Research and Development Establishment at Harwell, England, in view of his contributions to pure and applied physics and more particularly to the field of nuclear engineering.

The Senate has received word from Sir John Cockcroft, that he is pleased to accept this honorary doctorate. The award will take place on the day on which the anniversary of the university is celebrated in 1959, 10th January. Prof. dr. R. Kronig will act as promotor.

Programma Certaminis poetici ab academia regia disciplinarum Nederlandica ex legato Hoeufftiano in annum MCMLIX indicti

De uno et viginti carminibus ita est iudicatum: Praemium aureum reportavit nemo. Sumptibus Legati in volumen recipientur carmina q.t. *Iter peractum; Pellicientis lunae dolus; Castaneas; Castaneas Tostas; Homullus*, si eorum poetae scidularum aperiendarum dederint veniam. Sequuntur omnium carminum nomina: *1. Laudes C. Iulii Caesaris. 2. Iter peractum. 3. Pellicientis lunae dolus. 4. Actae commentariolus vitae. 5. Justus . . . Victima. 6. Ex ponto redix. 7. Catullus. 8. Castaneas, Castaneas Tostas. 9. De recentioribus inventis. 10. Romana puppis naufragii inscia. 11. Post pluviam. 12. Homullus. 13. Solacium miseris fraterna caritas. 14. Curius ad Tullium. 15. Tullius Tiro. 16. Henrico de Nicola. 17. Carthusia Trisulti Hernicorum in Latio. 18. Nausicaa. 19. Tibi, Flava Ceres. 20. Artis specimen poeticae. 21. Latentem Jesum mater quaeritans.*

Ad novum certamen cives et peregrini invitantur his legibus, ut carmina latina non ex alio sermone versa nec prius edita argumentive privati nec quinquaginta versibus breviora,[1] nitide et ignota iudicibus manu scripta ante Kal. Ian. A. MCMLIX mittantur ad "het Bestuur der Koninklijke Nederlandse Akademie van Wetenschappen, Trippenhuis, Amsterdam", munita sententia, item inscribenda scidulae obsignatae, quae nomen et domicilium poetae indicabit. Ceterum iudicibus gratum erit, si poetae in transscribendo portabile prelum britannicum *(type-writer)* adhibuerint, ac si, quemadmodum in editionibus poetarum fieri solet, sextum quemque versum numbero insigniverint.

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[1] Quod ad carminum longitudinem solus hic terminus condicionibus legati Hoeufftiani constitutus est. Licet igitur in posterum quoque sua libertas constet poetis, iudices Hoeufftiani permagni facient si, quoad fieri possit, carmina numerum quadringentorum utique versuum non excedent.

Praemium victoris erit nummus aureus quadringentorum florenorum. Carmen praemio ornatum sumptibus ex Legato faciendis typis describetur eique subiungetur alterum laude ornatum, si scidulae aperiendae venia dabitur. Id autem ante Kal. Iul. proximas fieri debebit. Exitus certaminis postremum in conventu Ordinis mense Aprili pronuntiabitur, quo facto scidulae carminibus non in volumen receptis additae Vulcano tradentur.

H. DOOYEWEERD
Ord. lit. Acad. Reg. ab actis.

Amstelodami, Kal. Mai.
A. MCMLVIII

DOCTORAL DISSERTATIONS

Theology

BEKER, ERNST JOHANNES. *Libertas. Een onderzoek naar de leer van de vrijheid bij Reinhold Niebuhr en bij Karl Barth;* (Libertas. An Enquiry into the Theory of Freedom according to Reinhold Niebuhr and Karl Barth).
Nijkerk, 1958.
University of Amsterdam.

HOLLADAY, WILLIAM LEE. *The Root Sûbh in the Old Testament, with Particular Reference to its Usages in Convenantal Contexts.* Leyden, 1958.
State University at Leyden.

MINNEMA, THEODORE. *The Social Ethics of Reinhold Niebuhr, a Structural Analysis.* Kampen, 1958.
Free (Reformed) University of Amsterdam.

TROOST, ANDREE. *Casuïstiek en situatie-ethiek. Een methodologische terreinverkenning;* (Casuistry and Situation Ethics. A methodological reconnaissance of the field).
Utrecht, 1958.
With summaries in English and German.
Free (Reformed) University of Amsterdam.

Law

COHEN, MAX ARNOLD. *Het blijversrecht. Een notarieel-juridische studie over het Oost-Nederlandse recht betreffende de vererving en de overgang bij leven van landbouwbedrijven;* (The Law with regard to Stayers. A notarial and juridical study of Eastern Netherlands law with regard to the inheritance of farms and their transfer during the lifetime of the original owner). Enschede, 1958.
University of Amsterdam.

Medicine

ANDEL, HENDRIKUS VAN. *Enkele klinische en pathophysiologische beschouwingen over het catatonieprobleem;* (Some Clinical and Patho-physiological Observations on the Catatony Problem). Groningen, 1958.
With a summary in English.
Free (Reformed) University of Amsterdam.

ARENDSHORST, JAN. *Galblaaschirurgie te Tilburg, 1951–1956. Een vergelijkend onderzoek over de indicaties tot exploratie van de galwegen, waarbij gebruik gemaakt is van de uitkomsten van het postoperatieve onderzoek bij 1315 patienten; tevens een onderzoek naar de waarde van de postoperatieve cholangiografie;* (Gall-bladder Surgery at Tilburg, 1951–1956. A comparative enquiry into indications for the investigation of the gall ducts, employing the results of post-operative enquiry with 1315 patients; also an enquiry into the value of post-operative cholangiography). Tilburg, 1958.
With summaries in English, French and German.
Free (Reformed) University of Amsterdam.

BOS, GERARDUS JOHANNES. *Klinische vormen en epidemiologische gegevens betreffende infectie door het E.C.H.O type 9 virus;* (Clinical Forms and Epidemiological data relating to infection by the E.C.H.O. Type 9 virus).
Leyden, 1958.
With a summary in English.
State University at Leyden.

BROUWER, ROBBERT. *Geurverschillen bij de mens als oorzaak van interindividuele verschillen in attractie voor malariamuskieten;* (Differences of Odour in the human body as the cause of differences from individual to individual in attraction for the malaria mosquito). Leyden, 1958.
With summaries in French and Spanish.
State University at Leyden.

CATE, HENRICUS WILLEM TEN. *Over verlaagde lichaamstemperatuur ten dienste van hartoperaties. Een experimenteel-chirurgisch onderzoek over de invloed van de leeftijd op de tolerantie van hypothermie en tijdelijke circulatiestilstand;* (On reduced body temperature for the purpose of heart operations. An experimental surgical enquiry into the influence of age on tolerance of hypothermy and temporary stoppage of the circulation). Amsterdam, 1958.
With summaries in English and French.
University of Amsterdam.

COSTER, JOHANNES FERDINAND. *Het onderkennen van tuberkelbacteriën;* (The Identification of Tubercle Bacilli).
Utrecht, 1958.
With a summary in English.
State University at Utrecht.

DOKTER, HEERT JAN. *Anti-thyreoide stoffen en aangeboren misvormingen;* (Anti-Thyroid Matter and Inherited Deformities). Goes, 1958.
With a summary in English.
University of Amsterdam.

HAAS, ROELAND ANTHONIE DE. *De groeibevorderende werking van octromelia- en vaccinia-virus bij experimenteel opgewekte huidtumoren van de muis;* (Growth Stimulus Effected by Octromelia and Vaccinia Viruses in Experimentally Stimulated Tumours of the Skin in Mice)
Leyden, 1958.
With a summary in English.
State University at Leyden.

HAEFF, PIET VAN. *De operatieve behandeling van de hallux valgus. Een klinische studie van enkele technieken;* (The Operative Treatment of Hallux Valgus. A clinical study of some techniques). Nymegen, 1958.
With a summary in English.
Roman Catholic University at Nymegen.

HERDER, BERNARD ADRIAAN DEN. *De arthrografie van het schoudergewricht;* (The Arthography of the Shoulder Joint). Amsterdam, 1958.
University of Amsterdam.

KLIJN, LEONARDUS CORNELIS. *Over de betekenis van de reactie van Paul en Bunnell voor de diagnose mononucleosis infectiosa;* (On the Significance of the Paul and Bunnell Reaction as regards Diagnosis of Mononucleosis Infectiosa). Leyden, 1958.
With a summary in English.
State University at Leyden.

LAMBERTS, HENDRIK BERNARD. *Chemische bescherming tegen beschadigende bestraling onderzocht aan enkele biologische reacties met zeer korte latentie;* (Chemical Protection against Harmful Radiation, Investigated by Means of a Number of Biological Reactions of Very Short Latency). Assen, 1958.
With summaries in English, French and German.
State University at Groningen.

LENTERS, GERRIT JAN WILHELM HENDRIK. *Oestrioluitscheiding in de urine en de anatomische toestand van de placenta, speciaal bij toxaemie;* (Oestriol Excretion in the Urine and the Condition of the Placenta with Special Attention to Toxaemia). Groningen, 1958.
With a summary in English.
State University at Groningen.

MEEL, PETRUS JOHANNES VAN. *Bijdrage tot de behandeling van de spondylitis tuberculosa bij volwassenen. De "vroege" spondylodese;* (Contribution to the Treatment of the Spondylitis Tuberculosa in Adults. "Early" Spondylodesis). Amsterdam, 1958.
With summaries in English, French and German.
University of Amsterdam.

OTTEN, HENDRIKUS ALBERTUS. *De betekenis van antistreptolysinetiter, streptokokkenagglutinaties en rose-test voor de diagnose en prognose van de reumatiode arthritis;* (The Significance of Anti-Streptolysinetiter, streptococcae Agglutinations and Rose Test in the Diagnosis and Prognosis of Rheumatoid Arthritis). The Hague, 1958.
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State University at Groningen.

REES, GUSTAV PETER VAN. *Invloed van progesteron op het peil van L. H. en F.S.H. in hypophysevoorkwab en bloedserum. (Gegevens over gehalte van en afgifte door de hypophyse);* (Influence of Progesteron on the L.H. and F.S.H. Level in the Anterior Lobe of the Hypophysis and Blood Serum (Data regarding the content and discharge by the hypophysis)). The Hague, 1958.
With a summary in English.
State University at Leyden.

SCHERPENBERG, HENRI JEAN CORNEILLE VAN. *Electron Microscopy of Normal and Regenerating Olfactory Epithelium in Man and the Cat.* Leyden, 1958.
State University at Leyden.

THUNG, PAUL JOAN. *Ovaria van oude muizen. Een vergelijkend gerontologisch onderzoek;* (Ovaria of Old Mice. A comparative gerontological enquiry). Assen, 1958.
With a summary in English.
State University at Leyden.

VISSER, HENDRIK KLAAS ALDERT. *Onderzoekingen over de aanmaak van foetaal haemoglobine na de geboorte;* (Investigations on the Postnatal Synthesis of Foetal Haemoglobin). Assen, 1958.
With a summary in English.
State University at Groningen.

VOOGD VAN DER STRAATEN, WILHELM ADOLF DE. *Over de gevoeligheid van phagocyterende granulocyten voor geslachtshormonen. Een onderzoek naar de mogelijkheid om phagocyterende granulocyten zodanig te sensibiliseren, dat hun activiteit in vitro wordt beinvloed door in het bloed aanwezige geslachtshormonen;* (Concerning the Sensitivity of Phagocytizing Granulocytes to Sex Hormones. An enquiry into the possibility of sensitivizing phagocytizing granulocytes so that their activity in vitro is influenced by sex hormones present in the blood). Leyden, 1958.
State University at Leyden.

VRIES, KLAAS DE. *Een onderzoek naar de asthmatische aard der borstklachten van de arbeiders in de steenkolenmijnen;* (An Enquiry into the Asthmatical Nature of Complaints of the Chest among Workers in the Coal Mines). Groningen, 1958.
With a summary in English.
State University at Groningen.

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BOEF, GERRIT DEN. *Bepaling en toepassing van kaliummanganaat;* (Determination and Application of Potassium Manganate). Amsterdam, 1958.
With a summary in English.
University of Amsterdam.

BROUWER, FOPPE INNE. *Leven en werken van E. Heimans en de opbloei der natuurstudie in Nederland in het begin van de twintigste eeuw;* (Life and Works of E. Heimans and the Rise of Nature Study in the Netherlands at the Beginning of the Twentieth Century). Groningen, 1958.
University of Amsterdam.

BROUWER, GERRIT PIETER. *Ionisatie van argon door alpha deeltjes met verschillende energieën*; (Ionization of Argon by Alpha Particles of Differing Energies).
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With a summary in English.
Free (Reformed) University of Amsterdam.

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State University at Leyden.

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With a summary in English.
State University at Leyden.

HERMANS, JAN. *Solution Properties of Deoxyribonucleic Acid.* The Hague, 1958.
State University at Leyden.

KLINKEN, JACOB VAN. *De toepassing van het Poisson-proces in de actuariele statistiek;* (The Application of the Poisson-Process in Actuarial Statistics). 1958.
With summaries in English, French and German.
Free (Reformed) University of Amsterdam.

KOLDEWIJN, BERNARD WILLEM. *Sediments of the Paria-Trinidad Shelf. Reports on the Orinoco shelf expedition. Vol. 3.* The Hague, 1958.
University of Amsterdam.

KRIJNEN, HERMANUS WILHELMUS. *Bereiding en enige eigenschappen van een gepasteuriseerde plasma-eiwitoplossing;* (Preparation and Certain Characteristics of a Pasteurized Plasma Solution of Albumen). The Hague, 1958.
With a summary in English.
University of Amsterdam.

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State University at Leyden.

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With a summary in Dutch.
State University at Leyden.

MOOLENAAR, ABRAHAM JOHANNES. *Colorimetrische bepaling van aldosteron in urine;* (Colorimetric Determination of Aldosterone in Urine). The Hague, 1958.
With a summary in English.
State University at Leyden.

NAPJES, PETRUS JAN. *Electrophoretische snelheid en electrisch geleidingsvermogen van natrium-carboxy-methylcellulose in oplossing;* (Electro-phoretic Speed and Electric Conductivity Capacity of Sodium-Carboxy-methyl-cellulose in Solution). The Hague, 1958.
With a summary in English.
State University at Leyden.

NOTA, DIRK JOHANNES GREGORIUS. *Sediments of the Western Guiana Shelf.* Wageningen, 1958.
State University at Utrecht.

PASMA, PIETER JELTE. *Polarization Measurements on d-D and d-T Neutrons.* The Hague, 1958.
With a summary in Dutch.
State University at Groningen.

ROSSUM, JACOBUS MARIA VAN. *Pharmacodynamics of Cholinomimetic and Cholinolytic Drugs. Theories on drug-receptor interactions and structure action relationships of quaternary ammonium salts.* Brugge, 1958.
With a summary in Dutch.
Roman Catholic University at Nymegen.

SOL, HARM HENDRIK. *Pretreatment and Chloride Uptake in Vallisneria Leaves. Influence of light, sugar, salts and pH on subsequent chloride accumulation.* Amsterdam, 1958.
State University at Groningen.

STAM, ADRIANUS BERTY. *The Relationship between Entamoeba Invadens Rodhain and its Hosts.* Utrecht, 1958.
State University at Leyden.

STRAATEN, HENRI VAN DER. *Some Exchange Reactions Investigated by Means of Radioactive Isotopes.* 1958.
With a summary in Dutch.
Municipal University of Amsterdam.

STUIVER, MINZE. *Biophysiscs of the Sense of Smell.*
The Hague, 1958.
With a summary in Dutch.
State University at Groningen.

VEDDER, WILLEM. *The Infra-red Absorption Spectrum of the Ammonium Ion in Lattices of the NaCl Type.* Amsterdam, 1958.
With a summary in Dutch.
University of Amsterdam.

ZWEEGMAN, HENDRIK WILLEM. *Precisie-viscosimetrie van oplossingen van polyisobutyleen in tolueen;* (Precise Measurement of Viscosity of Solutions of Polyisobutylane in Toluane). The Hague, 1958.
With a summary in English.
State University at Leyden.

Arts

KNAPPERT, JAN. *Het epos van Heraklios. Een proeve van Swahili poezie. Tekst en vertaling, voorzien van inleiding, kritisch commentaar en aantekeningen;* (The Hercules Epic. A Specimen of Swahili Poetry. Text and translation, provided with an introduction, critical commentary and notes). Alkmaar, 1958.
State University at Leyden.

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With summaries in English and Spanish.
State University at Leyden.

KOK, HENRICUS JOSEPHUS. *Proeve van een onderzoek van de patrocinia in het Middeleeuwse bisdom Utrecht;* (Trial Enquiry into the Patrocinia in the Bishopric of Utrecht in the Middle Ages). Assen, 1958.
University of Amsterdam.

KUIPER, ERNST JAN. *De Hollandse "schoolorde" van 1625. Een studie over het onderwijs op de Latijnse scholen in Nederland in de 17de en 18de eeuw;* (The Dutch "School Order" of 1625. A study of teaching at Latin schools in the Netherlands durings the 17th and 18th centuries). Groningen, 1958.
With a summary in Latin.
University of Amsterdam.

LENNEP, JOHANNA ELISABETH VAN. *Beleving en verbeelding in het tekenen. Een klinisch psychologische studie van de driebomentest;* (Experience and Imagination in Drawing. A Clinical Psychological Study of the Three Tree Test). Amsterdam, 1958.
With a summary in English.
University of Amsterdam.

SANDERS, MARIA JOHANNA ELISABETH. *Het Nederlandse kinderlied (van 1770–1940). Een bijdrage tot de kennis van het Nederlandse kunstkinderlied;* (The Dutch Nursery Rhyme from 1770 to 1940. A contribution to the knowledge of the art of the nursery rhyme in the Netherlands). Amsterdam, 1958.
State University at Leyden.

ZWAGER, HAJO HENDRIK. *De motivering van het algemeen kiesrecht in Europa. Een historische studie;* (The Motivation of Universal Suffrage in Europa. An historical study). Groningen, 1958.
University of Amsterdam.

Technical Science

HAGEDOORN, HENDRIK LAURENS. *Metingen met een proportionele teller bij beta-desintegratie;* (Measurements with a Proportional Counter in Beta-disintegration). The Hague, 1958.
With a summary in English.
Technological University at Delft.

KEMPEN, HENDRIK WILLEM JOSEPH. *Thermische omzetting van gasvormige koolwaterstoffen (raffinaderijgas) met stoom;* (Thermic Transformation of Gaseous Carburetted Hydrogen (Refinery Gas) with Steam). Delft, 1958.
With a summary in English.
Technological University at Delft.

MARS, PIETER. *De kinetica van oxidatiereacties op vanadiumhoudende katalysatoren;* (The Kinetics of Oxidation Reactions on Vanadium-containing Catalysers).
The Hague, 1958.
With a summary in English.
Technological University at Delft.

SOEMANTRI, MAS. *Aspects of Gas Chromatography and Selective Hydrotreating.* The Hague, 1958.
With summaries in Dutch and Indonesian.
Technological University at Delft.

Economics

ATALLAH, MUHAMMAD KARAM. *The Long-term Movement of the Terms of Trade between Agricultural and Industrial Products.* Delft, 1958.
Netherlands School of Economics at Rotterdam.

MEIER, EMILE WINFRIED. *De Europese economische integratie;* (European Economic Integration). Leyden, 1958.
Roman Catholic Institute of Economics at Tilburg.

SCHOLARSHIPS AND FELLOWSHIPS FOR FOREIGN STUDENTS, TENABLE IN THE NETHERLANDS 1)

Netherlands Universities Foundation for International Co-operation

27, Molenstraat, The Hague.

a. Scholarships for study at the Institute of Social Studies; *b.* Fellowships for study at the Institute of Social Studies; *c.* A limited number of other scholarships and fellowships.

1. *a.* Social Sciences (Two-Year Course),
   b. Public Administration,
   c. Unrestricted.
2. *a–b.* Institute of Social Studies, The Hague,
   c. The Netherlands.
3. Available to nationals of *all countries;* candidates must have for *a.* M.A. degree in social sciences, or its equivalent; for *b.* graduate (or equivalent) intellectual standard at and preferably some years of experience at middle or higher level of the public service; for *c.* advanced graduate status.
4. *a.* Fl 6080 (Two-Year Course in the Social Sciences),
   b. Fl. 2100 (Six-Month Course in Public Administration),
   c. Unspecified.
5. *a.* 16 months; *b.* 6 months; *c.* unspecified.
6. Unspecified[2].
7. *a–b.* The Rector, Institute of Social Studies, 27, Molenstraat, The Hague: *a.* by 30 June; *b.* by 15 October; *c.* Netherlands Universities Foundation for International Co-operation, 27, Molenstraat, The Hague.

Government of the Netherlands

Ministry of Education, Arts and Science, The Hague.
Exchange Scholarships of the Netherlands.
Netherlands-Belgian Cultural Convention.

1. Unrestricted.
2. Netherlands.
3. Available to *Belgian* nationals; must have university degree or have completed several years' higher study.
4. Fl. 300 per month plus tuition.
5. 1 to 6 months[1].
6. The Convention provides for exchanges of approx. 90 months; number awarded depends on the duration of each scholarship[2].
7. Ministère de l'Instruction Publique, Brussels, Belgium, in May.

Government of the Netherlands

Ministry of Education, Arts and Sciences, The Hague.
Exchange Scholarships of the Netherlands.
a. Anglo-Dutch Cultural Convention.
b. Netherlands-French Cultural Convention.

1. Unrestricted.
2. Netherlands.
3. Available to *a. British* nationals; must have a university degree or have completed several years' higher study; *b.* nationals of *France* who have completed several years' higher study.
4. Fl. 300 per month plus tuition.
5. *a.* 1 academic year; *b.* 1 to 6 months.
6. *a.* 5[2]; *b.* the Convention provides for exchanges of approx. 90 months; number awarded depends on the duration of each scholarship[2].
7. *a.* The Controller, Education Division, The British Council, 65 Davies Street, London, W. 1, England, by March 12;
   b. Office National des Universités et Ecoles Françaises, 95 Boulevard Raspail, Paris-6e, France, in May.

Government of the Netherlands

Ministry of Education, Arts and Sciences, The Hague.
Netherlands Government Scholarships.

1. Unrestricted.
2. Netherlands.
3. Available to nationals of *a.* Australia; *b.* Austria; *c.* Canada; *d.* Denmark; *e.* Germany; *f.* Iceland; *g.* India; *h.* Israel; *i.* Norway; *j.* Spain; *k.* Sweden; *l.* Yugoslavia; must have university degree or have completed several years' higher study.
4. ± Fl. 2700 plus tuition.
5. 1 academic year.
6. *a.* 3; *b.* 2; *c.* 1; *d.* 1; *e.* 3; *f.* 1; *g.* 1; *h.* 1; *i.* 2; *j.* 1; *k.* 1; *l.* 2.
7. *Australia:* Office of Education of the Commonwealth of Australia, Canberra; *Austria:* Bundesministerium für Unterricht, Minoritenplatz 1, Vienna; *Canada:* Netherlands Embassy, Ottawa; *Denmark:* Ministry of Education, Copenhagen; *Germany:* Deutscher Akademischer Austausch-

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The figures in the margin refer to: 1: field of study; 2: where tenable; 3: conditions; 4: value; 5: duration; 6: number available; 7: address for applications.
A "1" added after the duration of the scholarship indicates that it is renewable or extendible. A "2" added after the number of scholarships available indicates that the same award will be offered for 1959–'60.

dienst, Nassestrasse 11a, Bonn; *Iceland:* Ministry of Education, Reykjavik; *India:* Ministry of Foreign Affairs, New Delhi; *Israel:* Netherlands Legation, Jerusalem; *Norway:* Kontoret for culturelt samkven med utlandet, Oslo; *Spain:* Direccion General de Relaciones Culturales, Madrid; *Sweden:* The Swedish Institute, Jungsgaten 42, Stockholm; *Yugoslavia:* Commission for Foreign Cultural Relations, Bircaninova 6, Belgrade.

Government of the Netherlands

Ministry of Education, Arts and Sciences, The Hague.
Exchange Scholarships of the Netherlands.
Cultural Convention with Luxembourg.

1. Unrestricted.
2. Netherlands.
3. Available to nationals of *Luxembourg;* must have completed several years' higher study.
4. Fl. 300 per month plus tuition.
5. 1 to 3 months[1].
6. The Convention provides for exchanges of approx. 12 months; number awarded depends on the duration of each scholarship[2].
7. Ministère de l'Education Nationale, Luxembourg.

Government of the Netherlands

Ministry of Education, Arts and Sciences, The Hague.
Exchange Scholarship of the Netherlands.
Cultural Convention with Italy.

1. Unrestricted.
2. Netherlands.
3. Available to nationals of *Italy*, must have university degree or have completed several years' higher study.
4. Fl. 300 per month plus tuition.
5. 8 months.
6. 3[2].
7. Direzione Generale delle Relazioni Culturali, Ministere degli Affari Esteri, Piazza Firenze 27, Rome, Italy.

Government of the Netherlands

Ministry of Education, Arts and Sciences, The Hague.
Netherlands Government Scholarships.

1. Unrestricted.
2. Netherlands.
3. Available to *South African* graduates and undergraduates.
4. Fl. 3.000 plus tuition.
5. 1 academic year.
6. 10[2].
7. Genootschap Nederland-Suid-Afrika, p/a Prof. Dr. D. Pont, Waterkloofweg 266, Pretoria, South Africa.

Government of the Netherlands

Ministry of Education, Arts and Sciences, The Hague.
a. Hendrik A. van Coenen Torchiana Scholarship. *b.* Edward W. Bok Scholarship. *c.* Hendrik Willem van Loon Scholarship.

1. Unrestricted.
2. Netherlands.
3. Available to nationals of U.S.A.; age preferably under 28; must have bachelor's degree; applicants in the field of medicine must have M.D. degree; some knowledge of Dutch language desirable.
4. Fl. 2.700 plus tuition.
5. 1 academic year.
6. *a.* 1[2]; *b.* 1[2]; *c.* 1[2].
7. Institute of International Education, 1 East 67th Street, New York 21, N.Y., U.S.A. by November 1.

Government of the Netherlands

Ministry of Education, Arts and Sciences, The Hague.
Scholarships for Netherlands Summer Courses-

1. Subjects included in Dutch university summer courses.
2. Netherlands.
3. Available to nationals of *Italy* and *Spain.*
4. Fl. 400.
5. 1 month.
6. 7[2]: 3 to Italy; 4 to Spain.
7. *Italy:* Direzione Generale delle Relazioni Culturali, Ministero degli Affari Esteri, Piazza Firenze 27, Rome;
   Spain: Dirección General de Relaciones Culturales, Madrid.

Free (Reformed) University of Amsterdam

162, Keizersgracht, Amsterdam.
Scholarships.

1. Theology, philosophy, arts, medicine, law, natural sciences (chemistry, physics, mathematics, biology), social and economic sciences.
2. Netherlands: Free Reformed University of Amsterdam.
3. Available to nationals of *all countries;* must be educated to university entrance standard. Awards are to enable recipients to acquire academic knowledge based on Christian principles.

4. Maintenance, tuition and an amount for incidental expenses.
5. 1 academic year.
6. 4[2].
7. Secretary of the International Relations Committee, Vrije Universiteit te Amsterdam, Keizersgracht 166, Amsterdam, April 15.

Netherlands Organization for Pure Scientific Research

60, Lange Voorhout, The Hague.
Exchange Fellowships for Scientific Research.

1. Scientific research.
2. Netherlands.
3. Available to *French* nationals who are scientific research workers of proven ability, in exchange for similar facilities for Netherlands research workers offered by the National Council for Scientific Research in Paris.
4. Covers transportation, maintenance and research facilities.
5. Varies in individual cases.[1]
6. Unspecified[2]; as the convention between the Netherlands and the CNSR provides for exchanges of 30 months of fellowships in an academic year, number awarded depends on duration of each award.
7. Monsieur le Directeur du CNRS, 4e Bureau Echanges, 13 quai Anatole-France, Paris-7e, France.

Utrecht Observatory

2, Zonnenburg, Utrecht.
Exchange Assistantship.

1. Astronomy.
2. Netherlands: Utrecht Observatory.
3. Available, on an exchange basis, to students of theoretical or observational astrophysics in *any country*.
4. Exchange of salary.
5. Approx. 3 months.
6. 1[2].
7. Utrecht Observatory, University of Utrecht, 2, Zonnenburg, Utrecht.

Hague Academy of International Law

Peace Palace, The Hague.
Scholarships for the Academy's summer sessions, offered by various governments and by private and public institutions.

1. International law.
2. The Hague Academy of International Law.
3. Applicants' antecedents should qualify them to benefit from the tuition.
4. in 1958: Fl. 300, covering approximate expenses during the three-week session. Travelling expenses will not be refunded.
5. July – August, 1958.
6. No more than two scholarships can be awarded in respect of each country during the same year. This rule does not apply to scholarships instituted in a country for the benefit of its nationals, the award of which has been entrusted to the Curatorium of the Academy.
7. Secretariat of the Hague Academy of International Law, The Peace Palace, The Hague, before April 1.

French Institute in Amsterdam

Maison Descartes, 11, Museumplein, Amsterdam.
Donor: French Government.
Research Fellowships.

1. Unrestricted.
2. Netherlands: Maison Descartes, Amsterdam.
3. Available to *French* nationals engaged in study or research work for which documentation is available only in the Netherlands. Candidates must submit a plan of study with their applications.
4. Fl. 325.— (covers maintenance); room provided at Maison Descartes; transportation Paris-Amsterdam in certain cases.
5. 1 to 10 months, between October 1 and July 31.
6. Unspecified[2] (grants awarded are for a total of 50 months).
7. M. Henri Gouhier, professeur à la Sorbonne, 21 Boulevard Flandrin, Paris-16e, France, by May 1.

Fulbright Program

Scholarships in the Netherlands, Fulbright Agreement, U.S.A.–Netherlands.

1. Unrestricted.
2. Netherlands.
3. Available for U.S. citizens – students must have college-education at least; teachers M.A.; Lecturers Ph.D. degree.
4. *f* 538 per month + tuition (students)
   f 1284 „ „ (teachers)
   f 1350—*f* 1680 per month (lecturers)
   Travel costs paid to and from the Netherlands.
6. Approximate figures: 20 lecturers, 30 students, 20 teachers[2].
5. Duration: 9 months (students, lecturers), 10 months (teachers).

7. For students:
Institute of International Education,
1 East 67th Street, New York 21, N.Y.
For teachers:
Office of Education,
Department of Health, Education and Welfare, Independence Avenue, Washington 25, D.C.
For lecturers:
Conference Board of Associated Research Councils, 2101 Constitution Avenue, Washington 25, D.C.

Canada Council

a. Senior Fellowships;
b. Pre-Doctor's Degree Fellowships.

1. Unrestricted.
2. Netherlands.
3. Available to residents in Canada or Canadians living abroad *a.* scholars and teachers having a well-established record in the arts, humanities or social sciences. *b.* candidates are required to hold a Master's degree or have equivalent training; the proposed study must lead to a Doctor's degree.
4. *a.* average value of $ 4000 (plus travel allowance, plus two-thirds of travel allowance for wife) – subject in the case of members of university faculties and of Government Departments and agencies to the provision by the employer of an appropriate salary allowance.
   b. average value of $ 2000 plus travel allowance.
5. *a.* one year; *b.* one year[2].
6. Unspecified.
7. The Secretary, The Canada Council, 140, Wellington Street, Ottawa, Canada.
   a. by December 15; *b.* by January 15.

BASIC DATA ON INTERNATIONAL COURSES OFFERED IN THE NETHERLANDS [1]

(see also the "International Courses" Section in this Bulletin)

Institute of Social Studies

Information: The Rector, Institute of Social Studies, 27, Molenstraat, The Hague.

COURSES OFFERED:

a. Two-year Course in the Social Sciences. The study of social change and economic development in the widest sense. The course leads to the degree of Master of Social Sciences.
REQUIREMENTS FOR ADMISSION: Advanced academic standing in one of the social sciences.
NEXT COURSE STARTING: September 1959. Closing date for applications: June 1, 1959.

b. Six-Month Advanced Diploma Course in Public Administration.
REQUIREMENTS FOR ADMISSION: Advanced academic status and preferably some years of experience in the public service.
NEXT COURSE STARTING: January 1959. Closing date for applications: October 1, 1958.

c. Six-Month Advanced Diploma Course in Economic Planning and Social Accounting.
REQUIREMENTS FOR ADMISSION: Advanced academic status and preferably some years of experience in the public service.
NEXT COURSE STARTING: January 1959. Closing date for applications: October 1, 1958.

d. Six-Month Advanced Diploma Course in Social Welfare Policy for Low Income Countries.
REQUIREMENTS FOR ADMISSION: Practical experience in social work, preferably at the teaching and public service level.
NEXT COURSE STARTING: September 1959. Closing date for applications: June 1, 1959.

Technological University at Delft — Netherlands Universities Foundation for International Co-operation

Information: Netherlands Universities Foundation for International Co-operation, 27, Molenstraat, The Hague.

COURSE OFFERED:

International Course in Hydraulic Engineering. Three branches of study:
1. Tidal and coastal engineering;
2. Reclamation;
3. Rivers and navigation works.

The course lasts eleven months and leads to a Diploma.

REQUIREMENTS FOR ADMISSION: a degree in engineering of a recognized institution of higher learning.

NEXT COURSE STARTING: October 1958 (at Delft).

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[1] Courses are given in English only, unless otherwise mentioned.

Foundation "Training Courses and Research" — Netherlands Universities Foundation for International Co-operation

Information: Netherlands Universities Foundation for International Co-operation, 27, Molenstraat, The Hague.

COURSE OFFERED:

International Course on Small-Scale Industries. Theoretical and practical training in investigating and solving the specific problems of small-scale industries, and in finding a methodology which can be applied to the establishment of new industries. Successful attendance of the course leads to a diploma.

REQUIREMENTS FOR ADMISSION: B.Sc. or M.Sc. in engineering or equivalent degree of recognized universities.

NEXT COURSES: November 1958 until end of April 1959; May 1959 until end of October 1959.

International Training Centre for Aerial Survey

Information: The Dean, International Training Centre for Aerial Survey, 3, Kanaalweg, Delft.

COURSES OFFERED:

a. Photogrammetry, including cartography, topography and theory of errors;

b. Photogeology;

c. Use of air photographs for soil survey and other agricultural purposes;

d. The same for forestry and other sylvicultural purposes;

e. Air photography and survey navigation.

Lectures and instruction are given in English, French or German.

Courses are adapted to individual needs, and may therefore vary from some months to two years.

REQUIREMENTS FOR ADMISSION: Dependent upon the individual student's programme of study.

NEXT COURSE(S) STARTING: September and January.

Institute of Oriental Studies, Leyden

Information: The Secretary, Institute of Oriental Studies, 61, Rapenburg, Leyden.

COURSES OFFERED:

Language and culture of Indonesia and Malaya, The Arabian Countries, Japan, China.

REQUIREMENTS FOR ADMISSION: Candidates must be qualified for university studies in their own country.

NEXT COURSES STARTING: October 1958 (duration 3 or 7 months).

Netherlands Universities Foundation for International Co-operation

Information: NUFFIC, 27 Molenstraat, The Hague.

COURSE OFFERED:

"Survey of the Netherlands" — introductory courses on the Netherlands, lasting about one week. —

REQUIREMENTS FOR ADMISSION: usual requirements for university study.

NEXT COURSE: courses will be given during summer months, upon request, for groups of at least 15 students.

Bouwcentrum (Building Centre)

Information: Bouwcentrum, P.O. Box 299, Rotterdam.

COURSE OFFERED:

International Course on Building – in co-operation with the Central National Council for Applied Scientific Research in the Netherlands, TNO. The course is on the graduate level and lasts six months. Its object is to present a systematic basis for the treatment of the problems encountered in the building industry, as well as to give a number of practical methods for tackling these problems.

REQUIREMENTS FOR ADMISSION: B.A., B.Sc. or equivalent degree of recognized universities or colleges. Applicants must, in their own countries, have a task concerned with building.

NEXT COURSE STARTING: September 1959.

The Philips International Institute of Technological Studies

Information: Director of Studies, Philips International Institute, Eindhoven.

COURSES OFFERED:

a. Individual, theoretical and experimental study programmes on any subject within the range of Philips activities; for instance electronics and applications thereof, X-rays, light and lighting, etc.

b. Three-month course of lectures on basic electronics (October–December).

c. Three-month advanced-level course of lectures. The main subject of this course may differ from year to year but will generally be related to some form of applied electronics.

Teaching language is English. Nominal duration of a complete period of study is one year.

REQUIREMENT FOR ADMISSION: a graduate science degree.

Commencement of next course: In view of the individual character of the study, students may enter upon their course at any date; the courses mentioned will, however, usually start in October and February.

THE 4TH AND 5TH INTERNATIONAL COURSES ON SMALL-SCALE INDUSTRIES OF THE RESEARCH-INSTITUTE FOR MANAGEMENT SCIENCE (FORMERLY: FOUNDATION "TRAINING COURSES AND RESEARCH") AT DELFT WILL BEGIN ON NOVEMBER 4, 1958 AND ON MAY 5, 1959

These identical six months' advanced courses are designed for persons with an engineering degree or a comparable technical background. The course is divided into two equal periods of theoretical instruction and of practical work, adapted to the specific requirements of each participant. All instruction is given in the English language.

A CHOICE CAN BE MADE FROM AMONG THREE BRANCHES OF STUDY:

- Establishment and operation of new industries
- Improvement of conditions in already existing industries
- Establishment and management of training centres, institutions or organizations for the promotion of, and assistance to, small-scale industries

For the prospectus/calendar of the 1958–1959 courses, containing detailed information, please apply to:

THE REGISTRAR,
INTERNATIONAL COURSE ON SMALL-SCALE INDUSTRIES,
NETHERLANDS UNIVERSITIES FOUNDATION FOR INTERNATIONAL CO-OPERATION (NUFFIC)

27, MOLENSTRAAT
THE HAGUE, THE NETHERLANDS

INTERNATIONAL COURSE IN HYDRAULIC ENGINEERING

1958-1959

Delft
The Netherlands

Engineers from all over the world are studying this year in the International Course in Hydraulic Engineering at the Technological University of Delft. The programme of this 11 months' course includes:

LECTURES
EXCURSIONS
DESIGN WORK
PRACTICAL WORK

The participants are taking advantage of the experience and knowledge of leading Dutch engineers and of the many important hydraulic works now under construction or in operation in the Netherlands. All instruction is given in the English language.

THE COURSE WILL BE REPEATED IN 1958-1959,
BEGINNING OCTOBER 22, 1958.

According to the interests of the participants special attention can be paid to one of the following chief branches of study:

Tidal and Coastal Engineering (including harbours)
Rivers and Navigation Works
Reclamation (including ground-water recovery)

For prospectus and calendar of the 1958-1959 course, containing detailed information, please apply to:

THE REGISTRAR
INTERNATIONAL COURSE IN HYDRAULIC ENGINEERING
NETHERLANDS UNIVERSITIES FOUNDATION FOR INTERNATIONAL CO-OPERATION (NUFFIC)
27, MOLENSTRAAT
THE HAGUE, THE NETHERLANDS

The following institutions of higher education participate in the Netherlands Universities Foundation for International Co-operation:

State University at Leyden
State University at Groningen
State University at Utrecht
University of Amsterdam
Free (Reformed) University of Amsterdam
Roman Catholic University at Nymegen
Technological University at Delft
Agricultural University at Wageningen
Netherlands School of Economics at Rotterdam
Roman Catholic School of Economics at Tilburg
Technological University at Eindhoven

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